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**US ARMY MATERIEL DEVELOPMENT
AND
READINESS COMMAND**

**ANNUAL
HISTORICAL
REVIEW**



**FISCAL YEAR
1977**

**CLASSIFIED BY: CHIEF OF STAFF
DECLASSIFY ON: 30 SEPTEMBER 1983**

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**HEADQUARTERS
US ARMY MATERIEL
DEVELOPMENT AND
READINESS COMMAND
ALEXANDRIA, VA 22333**

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U.S. ARMY MATERIEL DEVELOPMENT
AND READINESS COMMAND

ANNUAL HISTORICAL REVIEW

FISCAL YEAR 1977
(RCS-CSHIS-6 (R3))

Prepared by

Historical Office

Headquarters, U.S. Army Materiel Development and
Readiness Command

1 February 1980

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CLASSIFIED BY: CHIEF OF STAFF, DARCOM

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PREFACE

This Annual Historical Review, prepared in accordance with the provisions of AR 870-5, covers the fifteenth year of the US Army Materiel Development and Readiness Command's (US Army Materiel Command prior to 26 January 1976) life. The history was prepared in part from submissions compiled by historical officers of headquarter's staff elements and project manager offices discussed in the text, and in part from sources referenced in footnotes assembled through various research programs. The Review serves as the official history of the Command and is used not only as a tool for orienting personnel newly assigned to the Command but also for the provision of historical precedent upon which to base current and future operations. It is also a valuable reference work used for the preparation of more comprehensive Command and Army histories.

FY 1977 was another year of change and challenge for DARCOM. The AMARC realignments continued and the year saw six new major subordinate commands established and two more organized provisionally. Though materiel development and acquisition had been getting increased emphasis since 1974, in 1977 readiness of the Total Army, which had always been a major concern for DARCOM, was getting greater attention at higher levels. Yet, the decline of resources available to DARCOM to accomplish its mission continued even though the Command was being required to take on new tasks and to increase the intensity of operations of existing programs. The AMARC reorganizations and DARCOM's efforts to meet the challenge of doing more with less are discussed in detail in the text.

The preparation of the history was a team effort. The team leader was Myles G. Marken, Senior Action Officer for Annual Historical Reviews, who planned and coordinated the entire project and also completed Chapter I, initiated by Mr. George Garand. Mr. Andrew Putignano prepared Chapter II-IX and XI. Dr. Howard Butler of the US Army Troop Support and Aviation Materiel Readiness Command prepared Chapter X. The manuscript was edited and proofed by Mrs. Betty J. Thomas assisted by Mrs. Guyanne Parker. Mrs. Thomas and Mrs. Parker also arranged for the graphics and prepared the glossary. Mrs. Thomas managed the manuscript through printing.

MYLES G. MARKEN, SR.
Senior Historian
Project Team Leader

DALE BIRDSELL
Chief Historian

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General J. R. Guthrie
Commander, DARCOM
May 1977-



LTG G. R. Sammet, Jr.
Commander, DARCOM
February 1977-May 1977
Deputy Commanding General for Materiel Development
October 1975-August 1977



General J. R. Deane, Jr.
Commander, DARCOM
February 1975-January 1977



LTG R.J. Baer
Deputy Commanding General
for Materiel Development
September 1977-



LTG E.J. D'Ambrosio
Deputy Commanding General
for Materiel Readiness



MG R.L. Kirwan
Chief of Staff
August 1974-October 1976



MG H.E. Gibson, Jr.
Chief of Staff
October 1976-October 1977
Director of Readiness
May 1976-October 1976



BG A.J. Cade
Deputy Comptroller
Acting Comptroller
September 1977-December 1977



COL H.S. Christensen
Director of Communications-
Electronics
June 1977-June 1979



MG H.A. Griffith
Director of Development &
Engineering
April 1976-May 1977



BG A.A. Nord
Director of Development &
Engineering
May 1977-July 1977



MG R.J. Lunn
Director of Development &
Engineering
July 1977-January 1979



MG I.A. Hunt, Jr.
Director of Battlefield
Systems Integration



Mr. J.C. Gilbert
Director of Management
Information Systems



BG L.S. Wright
Director of Personnel, Training
and Force Development
September 1974-July 1977



Mr. S.J. Lorber
Director of Quality Assurance



COL G.T. Feilke
Director of Plans
& Analysis



COL W.G. Wolfe
Director of Installations
& Services



BG T.H. Brain
Director of International
Logistics



MG F.E. Sheffey
Director of Materiel
Management
May 1976-September 1977



BG E.A. Vulley
Director of Materiel
Management
September 1977-December 1978



BG E.L. Konopnicki
Director of Readiness
July 1977-September 1978



BG H.F. Hardin
Director of Procurement
& Production
May 1976-February 1977



BG J.W. Sharp
Director of Procurement
& Production
May 1977-

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U.S. ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND ANNUAL HISTORICAL REVIEW FISCAL YEAR 1977

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CHAPTER I

COMMAND MANAGEMENT

Introduction

(U) During 1977 the US Army Materiel Development and Readiness Command underwent further changes in organization and missions resulting from the major realignment that had been under way since 1974. ARRCOM and ARRADCOM were organized 31 January 1977 from elements of ARMCOM and the Ballistics Research Laboratory and TSARCOM and AVRADCOM were organized 1 July 1977 from elements of TROSCOM and AVSCOM. The impact of these changes was even more pronounced because of several changes at the top level of command resulting in DARCOM having three commanders in less than six months. As in preceding years, there was a continuing command trend expanding the mission and responsibilities and reducing resources. To carry out its functions effectively and efficiently, DARCOM and its subordinate commands employed flexibility and ingenuity in overcoming a growing number of adverse factors that threatened to halt or disrupt many of the carefully planned DARCOM programs aimed at providing the US Army with quality materiel in sufficient quantity to meet expected contingencies on a global scale.

(U) General John R. Deane, Jr., who had commanded DARCOM since 12 February 1975, retired on 31 January 1977. Nominated to succeed him in this position was Lieutenant General John R. Guthrie who at the time of his nomination was serving as Commanding General, IX Corps, and US Army, Japan. Several months were to pass before General Guthrie was able to assume his new duties at Headquarters DARCOM. During the interval extending from General Deane's retirement to General Guthrie's arrival on 18 May 1977, Lieutenant General George R. Sammet, Jr. served as Commanding General of DARCOM.¹

(U) During his nearly two years in charge of the US Army's materiel readiness and development, General Deane had coped with a multitude of problems facing his command. They ranged from the US Army's relations with Congress, where a more positive posture was sought, to the recommendations of a review committee with respect to the acquisition of Army materiel that had been awaiting implementation since the Spring of 1974. Other problems calling for a solution were decision-making and improvement of customer relations with respect to the fielding of new equipment. From the very outset the new DARCOM

¹Ltr, LTG George R. Sammet, Jr. to HQDA, ATTN: DACS-GO, 1 Feb 77;
Ltr, DRCGC-S, LTG George Sammet, Jr. to HQDA & DARCOM Commanders,
1 Feb 77, Subj: Assumption of Command.

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commander made it one of his first priorities to overcome some of the adverse publicity the Army had incurred in initially embarking on the development and later discontinuing such major weapons systems as the Cheyenne Helicopter, the AH-56, and the Main Battle Tank (MBT-70/XM803). In the face of criticisms leveled at these seemingly false starts, General Deane retained a profound sense of purpose and optimism. He felt that more recently initiated programs within DARCOM were improving the efficiency, economy, responsiveness, and most of all, the image of the command.²

(U) In 1975, as in preceding years, a major portion of DARCOM's energy and resources needed to be devoted to the improvement of the Army's materiel acquisition process. In early 1976, to more accurately reflect the mission of his command, General Deane had redesignated the US Army Materiel Command as the US Army Materiel Development and Readiness Command. This new designation mirrored the complex situation in which the US Army found itself during the mid, and late, 1970's and to a large measure resulted from the conflicting posture which the Armed Forces of the United States maintained during this period. On the one hand, ever since 1974, DARCOM had been involved in an almost continuous reorganization and realignment, some of which featured the reduction in size or complete closure of a number of Army Depots, as well as a projection of DARCOM to consist of five readiness commands, eight research and development commands, and a test and evaluation command. While these above changes were in progress, a Depot Systems Command and an International Logistics Command were organized resulting from other actions originating within DARCOM. DESCOM was established to oversee the operation of the supply and maintenance depots and ILCOM was established to manage international logistics operations.

(U) The basic key to American military planning was the defense posture of the Soviet Union which in the mid, and late, 1970's continued to be a source of puzzlement and vexation to those concerned with the defense of the United States. There could be no doubt that since 1964 the Russians had been engaged in a sustained military buildup that both in magnitude and momentum of effort had reached impressive proportions as the decade was approaching its end. One of the most cogent realities was that this Soviet buildup had not responded to changes in the defense programs of the United States and her allies. Any increase in the size of the US defense budget had been accompanied by a corresponding increase in that of the Soviets. However, when the defense budgets of the United States and its allies were reduced, Russian spending increased anyway. While the United

²GEN Deane, "Reorganization Begins; RIF Predictions Difficult," AMC NEWS, HQ USAMC, Alexandria, VA, VOL 3, No. 10, Aug 1975, p. 1.

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States reduced the size of its forces in Europe in the late 1960's, the Russians stepped up their deployment of forces in Eastern Europe. When US nuclear forces in Western Europe stabilized in both quantity and quality, the Russians reinforced their nuclear forces on both counts. There has been no evidence indicating restraint on the part of the United States would be reciprocated by the Soviets unless negotiated agreements in specific and verifiable arms control were reached.³

(U) The expansion of the Soviet armed forces since 1964 may be demonstrated with just a few figures. The Soviets have increased their military strength by a million men while adding more than 1,000 ICBM launchers and more than 900 submarine-launched ballistic missile tubes to their strategic forces. The Red Army has deployed over 30 new divisions, and Soviet tactical aviation has grown by over 1,000 fighter aircraft. Even more impressive than this increase in numbers is the growth in the quality of both manpower and materiel.⁴ In reply to claims from some quarters that American technological advances had forced Russian competition, it should be noted that the Russians took the lead in deploying medium-range and intermediate range ballistic missiles, that they were the first to deploy antiballistic missile defenses, the first to deploy fractional orbital bombardment systems, and the first to deploy antisatellite systems.

(U) Following General Deane's retirement on 1 February 1977, as indicated earlier, Lieutenant General George R. Sammet, Jr., who had served as DARCOM Deputy Commanding General for Materiel Development under General Deane, temporarily assumed command of DARCOM. General Sammet's involvement with materiel procurement had begun more than two decades earlier while he was assigned to the Turkish Artillery School as a lieutenant colonel. At the time, he initiated a study to determine the reasons for the multitude of problems encountered in the employment of military vehicles in that part of the world. As a result of this study, Sammet was considered something of an authority on military transportation and henceforth found himself in Research and Development assignments that steadily increased in scope and complexity. In due course, this sequence of ever more responsible and complex command positions culminated in this final assignment at DARCOM, one of the most important and demanding positions in the peacetime Army.⁵

³Address by the Honorable Charles W. Duncan, Jr., Deputy Secretary of Defense, before the annual meeting of the AUSA on 16 Oct 78, p. 1.

⁴Ibid.

⁵Robert Moore, Ofc, Dep CG for Materiel Development, "LTG Sammet Heads DARCOM," in DARCOM NEWS, Vol. 5, No. 4, Feb 77.

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(U) When General Guthrie assumed command of DARCOM on 18 May⁶ 1977, he already had behind him a distinguished Army career that had included numerous assignments in the field of research and development. He had graduated from Princeton University in 1942 as an ROTC honor graduate and was commissioned a second lieutenant in the Field Artillery Reserve and immediately ordered to active duty. He received his Regular Army Commission in 1946. Key assignments in the course of his career included command of the 25th Infantry Division artillery in Hawaii; Staff Officer in the Requirements and Development Division, J-5; Directorate of the Joint Chiefs of Staff; and Assistant Division Commander, 2d Infantry Division, in Korea. From 1956 to 1958 he served his first tour of duty in the Office, Chief of Research and Development, Department of the Army, where he was first assigned to the Surface-to-Surface Missile Division and later to the Missile and Space Division. In time he became the Army staff project officer for Explorer I, the first scientific earth satellite launched by the United States and the Free World.

(U) Personnel at Headquarters DARCOM received a preview of some of their new commander's most prominent characteristics shortly before his arrival.⁷ General Sammet recorded General Guthrie's intention to visit all of the DARCOM field installations as soon as possible and provided a number of helpful hints to those who would be dealing directly with the incoming commander. In this respect, the staff were advised that General Guthrie liked a low key soft-sell approach; that he was capable of remembering figures cited to him for years and would hold those making them available accountable for their correctness. The staff were further cautioned that General Guthrie would be seeking their views and recommendations and disliked vague references to any command but insisted on being provided specific names and designations. He insisted that staff writing be clear, simple, and that it covered all the facts. It was his view that bad news never improved with age; consequently, he wanted no delays in being apprised of any. One of General Guthrie's philosophies was to get the job done regardless of who got the credit; on the other hand, he expected his people to accept responsibility for things that did not go well. The new commander expected to spend long hours on the job and for this reason the excuse that he could not be reached was not acceptable as an excuse. Being very much people oriented, he could be expected to show great concern for the EEO program, race relations, women in Government, promotion policies, and the rights of minorities, as well as programs dealing with physical fitness and organizational effectiveness.

⁶ Ltr, DRCGC-S, GEN John R. Guthrie to HQDA and DARCOM Commanders, 18 May 77, Subj: Assumption of Command.

⁷ Ibid.

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(U) Above all, General Guthrie wanted it understood that DARCOM was a military organization with a military mission. Even though its operation had to be efficient and businesslike he never wanted to have it referred to as a business organization regardless of the big dollars that were being spent. The new Commanding General did not plan to initiate any drastic changes at the outset as he was convinced that one of the things DARCOM needed most was some stability following what he believed had been a very drastic reorganization. As a result, previous delegations of authority and existing channels of command were to remain in effect for the immediate future. General Guthrie saw a difference between leadership, which he saw as an art, and management, which he viewed as a science, and he believed that DARCOM needed both.⁸

(U) One of the principal challenges that DARCOM faced in 1977 was to match reduced manpower resources, which had been declining steadily since the peak of the Vietnam War, with the increased workload levied upon the Command. Reduction in the size of the Army or the budget had not resulted in a proportionate decrease in the DARCOM workload but in fact it had increased during the decline of the Army size. DARCOM military strength had been declining every year since 1962. In October 1977, DARCOM civilian strength stood at some 37 percent below its 1962 organization strength. At this time, total Army strength, less DARCOM, was 8.4 percent above the 1962 baseline.⁹ Numerous factors outside of the Army program itself have contributed to this situation and it was apparent that the Command had reached the limit in its ability to absorb additional workloads without increases in resources or reduction of readiness. This was particularly true in the Depot Supply and Maintenance Operations where significant mission increases had occurred. Examples of additional duties levied on the Command were seen in the support of projects such as the USAREUR Air Line of Communications (ALOC) and the supply of Defense Logistics Agency items from US Army depots. While additional workloads had been absorbed, it must be noted that during the preceeding five years the depot system had been reduced by about 10,000 personnel spaces. During the period of these reductions in manpower which had to be absorbed, the density of equipment requiring depot supply and maintenance support showed significant increases.¹⁰

⁸ Ibid., p. 3.

⁹ Briefing, General Guthrie to DAIG, Oct 77, with attached Memo, LTC Moraski, in DRCHO Archives.

¹⁰ US Army Materiel Development and Readiness Command, Program Analysis and Resource Review, FY 79-83, Commander's Statement dtd 25 Feb 77, p. 2.

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(U) On a recurrent basis, from year to year a significant portion of the depot supply and depot maintenance requirements has been left unfinanced. The accumulated backlog was having an unavoidable impact upon the Army's materiel readiness, and the level of funding guidance provided for PARR use was clearly deficient. To AMC planners, obviously it was time to reverse the trend of accommodating increasing workload with constant or decreasing resources. It was plain to the DARCOM Commander that the present and projected level of resources could and would not provide DARCOM with the capability of sustaining the combat forces in wartime once they had exhausted their basic loads.¹¹

(U) In the face of all budgetary reductions and added workload thrust on the existing materiel development and depot system, the US Army's mission remained constant to deter aggression through readiness and should deterrence fail, to fight alongside our sister services and our Allies and win. Deterrence, to be credible, would require balanced military forces capable of protecting national interests wherever threatened. To that extent, it was seen that being able to fight and win was not an alternative to deterrence, it was the essence.¹²

(U) The ultimate objective of the Army was force readiness; the ability to man, equip, and train forces to accomplish their wartime mission. The Army's formal posture statement has annually described in some detail the continuing efforts on the part of the Soviet Union to modernize its forces and those of its allies. In recent years, the US Army relied on qualitative technological superiority to offset Warsaw Pact country numerical advantages. Recently, the disparity in ground force weapons and equipment was approaching both quantitative and qualitative superiority for the Warsaw Pact nations. DARCOM and the Army was moving as rapidly as possible as technology and resources permitted to achieve readiness through a continuing research and development effort and an enhanced procurement program; but the US Army was playing catch-up ball. Resources were directed to procurement of new families of weapons and equipment, such as the XM-1 tank and the Infantry and Cavalry Fighting Vehicles; the Stinger, Patriot, and Roland Air Defense Missile Systems, and the Black Hawk helicopter. Development continued of other important systems, such as the Advanced Attack Helicopter, modernization of our Theater nuclear forces, and improvement in chemical defense capabilities. These weapons and equipment systems would provide the US Army with capabilities which, according to best military judgment, were critical to success on the

¹¹ Ibid.

¹² Statement by General Bernard W. Rogers, Chief of Staff, US Army, before the Committee on Armed Services, House of Representatives, First Session, 96th Congress, 5 Feb 79.

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modern battlefield. It was judged that it would be several years before most of the pending Army materiel acquisition programs would field adequate quantities of this modern materiel, and even then only if levels of funding remained adequate.¹³

Military Plans And Operations

Mobilization Exercise 1976 (MOBEX)

(U) A major Army exercise sponsored by DA and designated as Mobilization Exercise 1976 (MOBEX 76), was conducted during the period of 8 November through 9 December 1976. FORSCOM was designated by DA as the Executive Agent to conduct MOBEX 76 which was designed to cover all aspects of mobilization of Reserve Components. It involved the participation of HQDA, CONUS MACOM's (except ASA and Recruiting Command), all CONUSA headquarters, all Army Readiness Regions, 31 of 50 state AG's, 18 of 19 ARCOM's, six installations as mobilization stations, and 25 installations as supporting installations. DARCOM participation in the actual play was limited to HQ DARCOM and the six major commodity commands. TROSCOM served as the single DARCOM source to receive and process MOBEX 76 requisitions.

(U) The broad objective of the exercise was to evaluate the Army's mobilization plans and procedures. The mobilization time frames utilized were M+1 through M+5 which were compressed to occur during the first 18 days of the exercise. Only a sample (approximately 18%) of the mobilization force structure was actually played. This consisted of some 274 ARNGUS and 296 USAR units mobilizing at the six playing installations; i.e., Ft. Benning; Ft. Drum; Ft. Hood; Ft. Lewis; Ft. McCoy; and Camp Roberts.

(U) DARCOM participation in MOBEX 76 actually began in September 1975 during the early planning phase to develop details and parameters for exercise play. A series of planning conferences were held involving HQDA, FORSCOM, DARCOM and other MACOM's/agencies participating in the exercise. In December 1975, a decision was made, and mutually agreed upon, to play requisitions for DARCOM items from one NICP (TROSCOM). Likewise, requisitions for DLA items were received and processed from HQ DLA (Cameron Station). In order to accomplish NICP play of the exercise requisitions, a unique ADP system was developed under a GSA administered contract for use on a separate computer at TROSCOM to preclude interference with real-world traffic. Further precautions included the utilization of unique document identifier codes, project codes, advice codes, and content indicator codes for the exercise requisitions.

¹³Ibid., pp. 3-4.

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(U) A MOBEX master file was built by consolidating asset data provided by each major commodity command (NICP) consisting of a one time dump of specified sectors of their National Stock Number Master Data Record (NSNMDR). This master file served as the data base against which the exercise requisitions were processed. Only draw-downs against these assets were made, there were no add-ons. The total number of NSN included in the MOBEX file was 367,818; however, during the exercise play only 38,469 requisitions were processed. The requisitions/requirements played were generated by the playing RC units and by FORSCOM for the non-playing units (the remaining RCU's in the force structure). There were 17,633 "issues" made against the total requisitions received which constituted a first pass fill of 46 percent. In addition to the requisition play, equipment left behind by units deploying to POMCUS was played. This equipment is referred to as POMCUS residual assets. The play of this equipment was quite limited due to the fact that manual processing was required. All NICP's except MIRCUM were involved in the play of the POMCUS residual equipment.

(U) Post-MOBEX actions included the preparation of a Preliminary After Action Report and a Final After Action Report. The DARCOM Final After Action Report was furnished to FORSCOM on 25 April 1977 and indicated the extent of materiel shortages to meet the requisitions/requirements.

DA Force Mobilization Steering Committee

(U) On 26 January 1977, HQ FORSCOM briefed the Chief of Staff of the Army on the initial review of data based on the conduct of MOBEX 76. As a result of this briefing, the Chief of Staff directed that a general officer-level task force be formed to expedite the solution of the many problems identified during the MOBEX. A general officer-level committee was formally established on 14 April 1977 as the "DA Force Mobilization Steering Committee" with general officer (or civilian equivalent) representation from various elements of the DA staff, and from DARCOM, FORSCOM, TRADOC, and MILPERCEN. The committee, chaired by the Director, Operations and Readiness, ODCSOPS, has 17 other members.¹⁴ The first meeting of the committee was held on 26 May 1977 in a joint meeting with the Force Mobilization Review and Evaluation Committee. This was a lower level committee and included similar representation and had been in existence for some years.

(U) The Chief of Staff of the Army approved a five-phased mobilization improvement program the objective of which was to assure total Army mobilization and war capabilities. It was seen that every phase

¹⁴DA ltr, 14 Apr 77, Subj: DA Force Mobilization Steering Committee.

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and detail of the transition to war needed to be planned for immediately while there was still time to plan, identify and solve problems, reduce preparation times, and accelerate deployment of combat ready forces. As viewed by the Army Staff, this would require all the major commands to be expert in all phases of the planning and execution of mobilization and deployment. Completion of the five phase program was expected by April 1979.

Program Plans and Policies

Command Management By Goals And Objectives

(U) Several significant actions were taken in FY 1977 to make the DARCOM System of Management by Goals and Objectives (MGO) more responsive to the needs of the Command. The governing regulation (Vol. 2, DARCOM Reg. 11-4) was revised and new DARCOM goals were developed. Volume 2 was revised as a part of the overall revision of the 13 volumes of the DARCOM Resource Management System. This revision updated the System's concept, policy, definitions, procedures and responsibilities.

(U) The proposed new DARCOM Goals were developed in accordance with the CG's directive that they be in line with the intent of the Total Army Goals which were approved by the Secretary of the Army and Chief of Staff on 21 September 1977. The proposed goals were submitted for the commander's approval on 29 September as a first step toward publishing the goals, implementing objectives, programmed tasks and supplemental narrative guidance in the FY 1978 HQ DARCOM Program Plan. On the same day, the list of 108 possible subjects for objectives was developed and submitted to the DCGMR and DCGMD. Each was requested to review and revise the list as necessary to reflect required and specific improvements within the Command. The CG planned to receive periodic reports of progress toward these objectives from individual staff members and from the Comptroller (Review and Analysis Division) during FY 1978.

(U) This policy was affirmed by the CG during early Performance Indicator Review Briefings. The FY 1977-78 DARCOM Headquarters Program Plan provided the basis for staff elements to choose the Performance Indicators they would show the Commander to reflect their performance. During 1978, more effort by the various staff elements was to be directed toward insuring that measurable objectives and tasks were instituted to track progress toward the DARCOM Goals. The measures were to be real performance indicators. The product was to be an integrated system of goals--functions performed to accomplish mission and meet goals--performance indicator reviews to feedback, measure progress, and justify resources.

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Decentralization

(U) The Directorate for Plans and Analysis was given responsibility for the DARCOM FY 1977 Goal No. 7: "Maximize Delegation of Authority and Commensurate Responsibility within all Elements of DARCOM." In accordance with this goal, efforts were to be made to insure that authority was delegated to the lowest possible operating level. In February 1977, a request was sent to the field to identify possible areas of decentralization. After sifting replies, 79 were accepted as bonified areas for consideration of delegation of authority to field elements.

(U) The submissions were farmed out to the headquarter's staff for action. Every effort was made to delegate, with the burden of proof being on the staff when non-delegation was recommended. The policy was that only the Commander could approve a denial of requested delegation, while approvals were within the authority of the responsible staff element. With the change in Commander, however, the policy was revised. General Guthrie wished to be shown all proposed delegations. At the close of the fiscal year, 18 were recommended for approval, 53 were recommended for disapproval, and 8 were pending. The briefing for the CG was scheduled for January 1978 when he was to be given an overall view of the program. He was then expected to make the final decision on each proposal.

AMARC

(U) The recent realignments of the structure of DARCOM resulted from the Army Materiel Acquisition Review Committee (AMARC) Study. As a brief background, the Secretary of the Army called together a group of high level experts from private industry (President, Vice President level) and government to take a hard look at the Army Materiel Command. They did, for a 90-day period which ended in April 1974. Their study contained 172 recommendations of which 71 were assigned to DARCOM for action.

(U) Their primary finding was that DARCOM, then AMC, had been more concerned with the readiness of our forces than with the materiel development and acquisition process. In other words, specifically, they found that the AMC commodity commanders were spending an inordinate amount of time keeping the equipment in the hands of the troops in the highest possible state of readiness at all times; sometimes, to the detriment of the R&D program, thereby degrading our preparation for future conflicts. They indicated that AMC commodity commands (MICOM & AVSCOM excepted) should be separated into mission oriented development centers for RD&E and initial procurement, and into logistics or readiness centers to perform the follow-on procurement and logistic support functions.

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(U) This determination resulted in a proposal that the total materiel acquisition process (RDT&E) be separated from the logistics and materiel functions through a command-wide reorganization. Following the AMARC basic operational concept, all research, development, and new materiel acquisition-oriented functions were being assigned to research and development commands. This included initial procurement and deployment of equipments. The readiness command then was to take over responsibility for follow-on procurement of end items and repair parts, as well as for follow-on logistics, during the remaining complete life cycle of the equipment.

(U) The status of these realignments at the close of FY 1977 was that all had been completed with the exception of the Electronics Command (ECOM). ECOM realignments were approved and announced publicly on 13 July 1977. The flag raising ceremony for the three commands to be formed was scheduled for January 1978. (See Charts 1 and 2 for realignment status of DARCOM). Details regarding the specific realignments are discussed in the following paragraphs.

(U) TACOM Realignment Separates R&D From Logistics Functions. Transitional changes phased into the US Army Materiel Development and Readiness Command were progressing in two new organizations, activated 1 July 1976 from facilities and manpower resources of the former US Army Tank-Automotive Command (TACOM), Warren, Michigan. The US Army Tank-Automotive Research and Development Command (TARADCOM) and the US Army Tank-Automotive Materiel Readiness Command (TARCOM), collectively have the same basic mission as the former TACOM. TARADCOM responsibilities were to encompass management of basic design, development, and modification of tank-automotive items and other assigned research projects, including reliability and maintainability assessment, test policy, and over-all test management. Additionally, TARADCOM would manage the integrated logistics support for initial fielding of these systems, and perform quality assurance through development and early deployment of weapon systems, secondary items, system-peculiar parts, and subsystems. TARADCOM engineering functions were to include research, development, engineering development, and EPR (Equipment Procurement Report) correction. Major product improvements were to be done by TARADCOM for both new commands, but each would handle minor product improvements in its assigned areas.

(U) Integrated Logistics Support was to be another important TARADCOM function. This would include responsibility for initiating, developing and publishing policies, doctrine and techniques for adequate logistics support of tank-automotive vehicles, and weapons systems being introduced to the customer. Initial provisioning, preparing manuals and other publications, logistics engineering support, repair parts, tools and training were also made concerns of TARADCOM.

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U.S. ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND

DARCOM HQ. ☆ ALEXANDRIA, VA

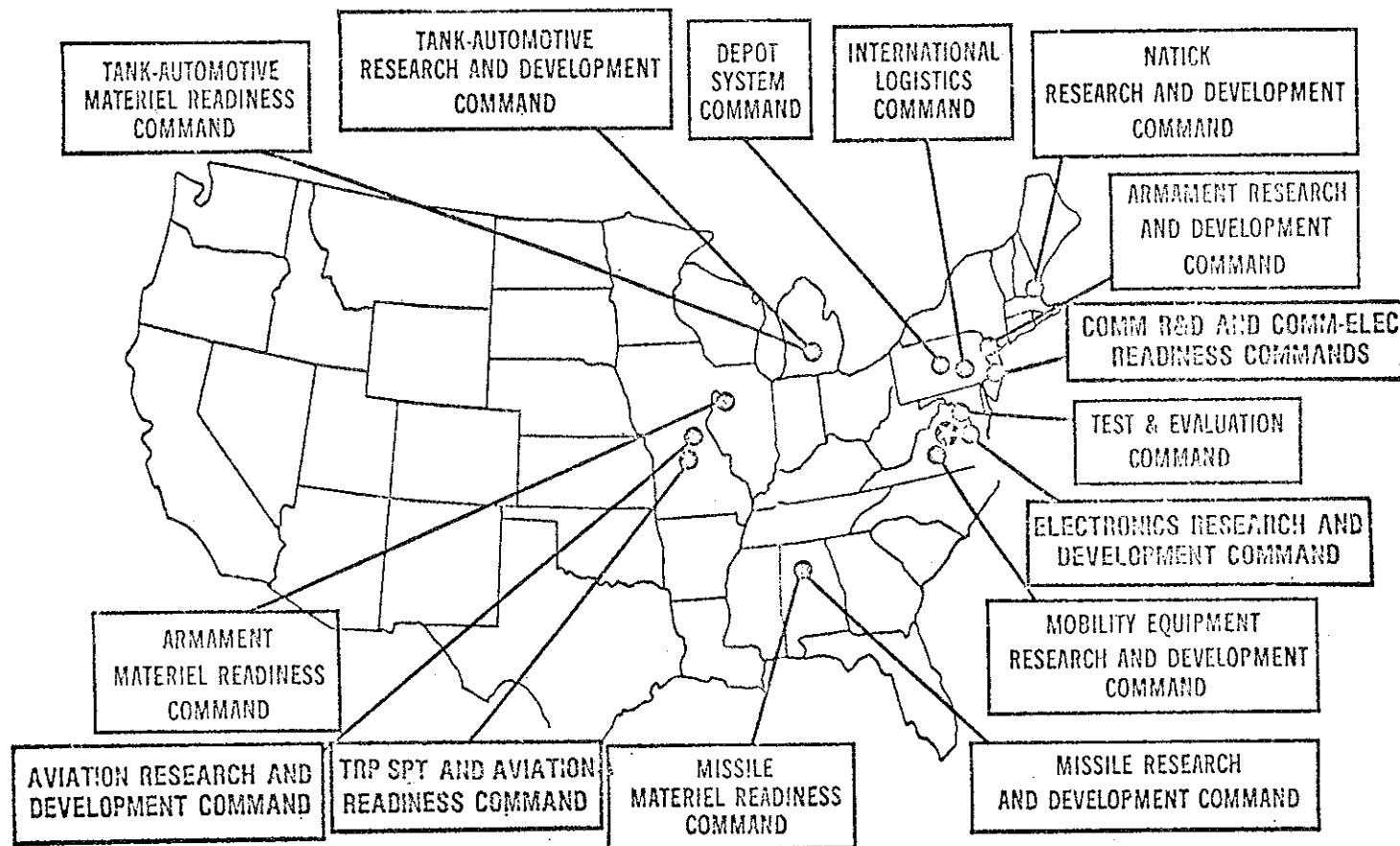


Chart 1

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30 September 1977

DARCOM MAJOR SUBORDINATE COMMANDS
(Established/To Be Established)

| <u>COMMAND</u> | <u>SUCCEEDING</u> | <u>ESTABLISHED</u> | <u>ORDER, DATE</u> | <u>REMARKS</u> |
|---|---|---------------------------|-----------------------------|--|
| US Army Armament Materiel Readiness Command (ARRCOM), Rock Island, IL | US Army Armament Command (ARMCOM), Rock Island, IL | 31 Jan 77 | DARCOM PO 25-1 30 Sep 76 | |
| US Army Armament Research & Development Command (ARRADCOM), Dover, NJ | * | 31 Jan 77 | DARCOM PO 25-1 30 Sep 76 | |
| US Army Troop Support and Aviation Materiel Readiness Command (TSARCOM), St. Louis, MO | US Army Aviation Systems Command (AVSCOM), St. Louis, MO and US Army Troop Support Command (TROSCOM), St. Louis, MO | 1 Jul 77 | DARCOM PO 50-1 16 Jun 77 | |
| US Army Aviation Research & Development Command (AVRADCOM), St. Louis, MO | * | 1 Jul 77 | DARCOM PO 50-1 16 Jun 77 | |
| US Army Electronics Research & Development Command (ERADCOM), Adelphi, MD | * | (Provisional) 1 Apr 77 | DARCOM PO 25-1 30 Mar 77 | Permanent establishment planned for 1st Q FY 78. Orders will not be available in time to have flags for organizational ceremonies. |
| US Army Communications-Electronics Materiel Readiness Command (CERCOM), Fort Monmouth, NJ | US Army Electronics Command (ECOM), Fort Monmouth, NJ. (Existing until 1st Q FY 78) | | | Establishment planned for 1st Q FY 78. |

Chart 2

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DARCOM MAJOR SUBORDINATE COMMANDS (Established/To Be Established)--Continued.

| COMMAND | SUCCEEDING | ESTABLISHED | ORDER, DATE | REMARKS |
|---|---|-------------|-----------------------------|---------|
| US Army Test and Evaluation Command (TECOM) | Remaining | 1 Aug 62 | AMC GO 4 23 May 62 | |
| US Army International Logistics Command (ILCOM) New Cumberland, PA | | 1 Nov 75 | AMC GO 171 23 Oct 75 | |
| US Army Mobility Equipment Research & Development Command (MERADCOM), Fort Belvoir, VA | * | 23 Jan 76 | DARCOM GO 12 26 Jan 76 | |
| US Army Natick Research & Development Command (NARADCOM), Natick, MA | * | 23 Jan 76 | DARCOM GO 12 26 Jan 76 | |
| US Army Tank-Automotive Materiel Readiness Command (TARCOM), Warren, MI | US Army Tank-Automotive Command (TACOM) | 1 Jul 76 | DARCOM GO 91 8 Jun 76 | |
| US Army Tank-Automotive Research & Development Command (TARADCOM), Warren, MI | * | 1 Jul 76 | DARCOM GO 91 8 Jun 76 | |
| US Army Depot Systems Command (DESCOM), Chambersburg, PA | | 1 Sep 76 | DARCOM PO 17-2 30 Aug 76 | |
| US Army Missile Materiel Readiness Command (MIRCOM) Redstone Arsenal, AL | US Army Missile Command (MICOM), Redstone Arsenal, AL | 31 Jan 77 | DARCOM PO 4-1 19 Jan 77 | |
| US Army Missile Research & Development Command (MIRADCOM), Redstone Arsenal, AL | * | 31 Jan 77 | DARCOM PO 4-1 19 Jan 77 | |

Research and Development Commands organized from research and development elements of previous commodity commands (and sometimes other elements).

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Two TARADCOM special offices, reporting directly to the commanding general, were the Improved TOW Vehicle (ITV) Project Manager's Office and PO.M551 (Sheridan) Systems. TARADCOM would program and budget its own RDT&E projects. However, both TARCOC and TARADCOM have their own procurement appropriations for major items. TARCOC would have the appropriation and the procurement function for secondary items, stock fund, and financial and accounting services for both commands. Additionally, TARCOC was to provide support for both commands, including publications, initial provisioning, maintenance engineering, NICP functions, international logistics, depot operations, modification work orders, and the methods operational research procedures (MOP) shop.

(U) In the product assurance area, TARADCOM was to provide the Reliability, Availability, Maintenance (RAM) Data Base for both commands. Each command performs RAM engineering, first-article testing, quality assurance planning and execution, and production. Product assurance in depot overhaul was also TARADCOM's responsibility.

(U) TARCOC was to furnish support to TARADCOM by providing facilities, utilities, communications and such services as automatic data processing, a civilian-military personnel office, and legal, small business, public affairs, and historical reports. Financial control was to be maintained through the TARCOC comptroller. Separate office chiefs would manage such areas of responsibility as Equal Opportunity, Safety, Legal, Inspector General, Public Affairs, and Security. TARCOC's authorized strength at the close of FY 1977 was 4,520 civilian and 259 military personnel. Command responsibilities included integrated management of procurement, production, maintenance, supply and repair parts, support of fielded tank-automotive systems, including construction and material handling equipment. Similar services were also to be provided to friendly foreign nations involved in Foreign Military Sales, and Military Aid and Assistance Programs. TARCOC also provided a major logistic function as the National Inventory Control Point (NICP) and National Maintenance Point (NMP) for the vehicles and equipment it managed. The TARCOC Support Activity at Selfridge, with its 224 military and civilian personnel, was also responsible for selected maintenance and facilities engineering, and related support services.

(U) Realignment of ARMCOC. The realignment of the Armament Community into a Development Center and a Logistics Center began on 2 December 1975 when the Secretary of the Army announced the formation of the two commands. Effective 31 January 1977, the US Army Armament Command, Rock Island, Illinois was disestablished. Concurrently, the two new commands were established: the US Army Armament Research and Development Command (ARRADCOM), Dover, New Jersey, and the US Army

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Armament Materiel Readiness Command (ARRCOM), Rock Island, Illinois. ARRADCOM was to be responsible for all research, development, and programming of assigned weapon systems. ARRCOM was to be responsible for all Logistic and Readiness support for these weapon systems. Although the primary objective of the realignment was the improvement of Army armament functions, it was thought significant economies would also result. When completed in FY 1980, it was anticipated that there would be a total of 122 military and 5,775 civilian jobs affected of which 43 military and 2,612 civilian jobs would be eliminated, and 79 military and 3,163 civilian jobs transferred. The closure of Frankford Arsenal was included. The number of jobs affected by the realignment was based upon the Armament Command's end FY 1976 manpower authorizations, upon current budgetary and strength projections. The estimated reduction in annual operating costs upon completion of the realignment, including the FY 1977 portion of the Frankford Arsenal closure was approximately \$42 million. The one-time cost of the realignment was expected to be approximately \$86 million. The resources freed by the realignment were to be reallocated to improve Army combat forces. It is expected that the entire realignment will be completed by 1980.

(U) Realignment of MICOM. Effective 31 January 1977, the US Army Missile Command (MICOM), Redstone Arsenal, Alabama was abolished and the US Army Missile Research and Development Command (MIRADCOM) and the US Army Materiel Readiness Command (MIRCOM) were established. There were no significant changes in the employment of military and civilian employees as a result of the reorganization. The new commands were staffed with military and civilian personnel previously assigned to MICOM. Under the realignment, the Missile R&D Command concentrated on the development and initial procurement of missiles and rockets; the Materiel Readiness Command was to accomplish follow-on procurement of such weapons and provide support in maintaining their operational readiness. The Materiel Readiness Command was also assigned responsibility for operation of the Redstone Arsenal installation. Program/Project/Product offices managing specific missile and rocket systems were assigned to one or the other command depending on the phase of the materiel life cycle of the missile system. Most fielded systems, such as LANCE, TOW and DRAGON missile systems and the 2.75 inch aircraft rockets, were assigned to the Materiel Readiness Command. The Army Metrology and Calibration Center was also assigned to the Materiel Readiness Command; the Missile Intelligence Agency was assigned to the R&D Command.

(U) Realignment of AVSCOM and TROSCOM. On 1 July 1977, HQ, US Army Troop Support Command (TROSCOM) and HQ, US Army Aviation Systems Command (AVSCOM) were discontinued and the US Army Troop Support and Aviation Materiel Readiness Command (TSARCOM) and the US Army Aviation Research and Development Command (AVRADCOM) were established.

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The realignment began 39 months previously on 1 April 1974, upon the release of the report of the Army Materiel Acquisition Review Committee (AMARC). The period from April 1974 thru November 1976 was devoted to preparation of numerous concept studies and the development of alternatives which was capped on 24 November 1976, when the Office of the Secretary of the Army approved the decision on the AVSCOM/TROSCOM realignment. The evolution of AVSCOM/TROSCOM to AVRADCOM/TSARCOM results in a savings of 335 civilian personnel positions. One time costs of \$14.2 million include \$0.5 million for movement of supplies and equipment and \$13.2 million for renovation of facilities at the Federal Center and annual recurring savings of \$6.7 million.

(U) DARCOM Realignment Climaxes with ERADCOM, CORADCOM, CERCOM. Prolonged controversy, involving options for reorganization of the staffs and the functions of the US Army Electronics Command, Harry Diamond Laboratories and portions of Army Security, now INSCOM, was resolved in July 1977 when DA announced that the US Army Electronics Command (ECOM) would be split primarily between the Electronics Research and Development Command (ERADCOM), the Communications R&D Command (CORADCOM), and the new Communications and Electronics Materiel Readiness Command (CERCOM). Two relatively minor activities, the USA Avionics Laboratory and the Office of the Project Manager, NAVCOM (Navigation/Control Systems) were to be reassigned to AVRADCOM, effective 1 January 1978. CORADCOM Headquarters was to be established at Fort Monmouth, New Jersey where ECOM Headquarters had operated since 1962. The headquarters of the new Communications and Electronics Materiel Readiness Command (CERCOM) was also to be at Fort Monmouth. Plans called for the formation of ERADCOM Headquarters in Fiscal Year 1978 at Adelphi, Maryland, the location of Harry Diamond Laboratories. The bulk of the Combat Surveillance and Target Acquisition Laboratory, the Electronics Devices and Technology Laboratory, and the Electronics Warfare Laboratory was to continue to operate at Fort Monmouth, New Jersey. The surveillance and acquisition functions associated with laser and related technologies were being relocated from Fort Monmouth and Adelphi to Fort Belvoir, Virginia. The signal warfare functions performed by Intelligence and Security Command at Arlington Hall Station, Virginia, and Vint Hill Farms Station, Virginia, were to be consolidated at Vint Hill. A small number of functions associated with atmospheric sciences research and development were to be moved from Fort Monmouth to the Atmospheric Sciences Laboratory at White Sands Missile Range, New Mexico.

(U) Project Managers for REMBASS (Remotely Monitored Battlefield Sensor System), Firefinder (Mortar Artillery Locating Radar) and SOTAS (Standoff Target Acquisition System) would be assigned to ERADCOM but remain at Fort Monmouth. This also applied to the US Army Office

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of the Project Manager, Signal Intelligence/Electronic Warfare which would be assigned to CERCOM. CERCOM was to consist of all of the ECOM logistics elements now at Fort Monmouth, Sacramento Army Depot, California, and Fort Huachuca, Arizona.

(U) Subordinate elements of the new CORADCOM would include: the Office of the Program Manager ARTADS; the Offices of the Project Managers, Tactical Operations Systems/Operations and Intelligence Tactical Data Systems (TOS/OITDS), Tactical Fire Direction System/Field Artillery Tactical Data Systems (TACFIRE/FATDS), Position Location Reporting System/Tactical Information Distribution System (PLRS/TIDS), Army Tactical Communications System (ATACS), Multi-Service Communications Systems (MSCS), Single Channel Ground and Airborne Radio Subsystem (SINGARS), Automatic Test Support Systems (ATSS), all located at Fort Monmouth, New Jersey. The Office of the Project Manager, Missile Minder/Air Defense Tactical Data Systems (MM/ADTDS) was located at Redstone Arsenal, Alabama. The Office of the Deputy Program Manager, Joint Tactical Information Distribution System (J-TIDS) was at Hanscom AFB, Maine. The US Army Communications Research and Development Command Test Facility was located at Fort Hood, Texas.

(U) Other CORADCOM activities located at Fort Monmouth would include the following: the US Army Tactical Computer Systems Center (CENTACS), the US Army Communications Systems Center (CENCOMS), the US Army Systems Engineering and Integration Center (CSEI), and the following US Army Communications Research and Development Command Field Offices: the Army Communicative Technology Office at Fort Eustis; the Resident Development Office at Van Nuys, California; Fort Leavenworth Field Office at Fort Leavenworth, Kansas; and the European Field Office.

(U) Implementation of the over-all reorganization of the three commands was to be phased over a three year period. The realignment would affect 659 civilian jobs, with 345 to be eliminated and 314 transferred. Also involved were 38 military spaces. Projected benefits of the total realignment include reduction of annual operating costs by \$4.0 million. One time costs of the change are estimated at \$13.4 million - \$10.7 million for ERADCOM and about \$2.7 million for CORADCOM and CERCOM.

Base Realignment Program

(FOUO) In response to a March 1977 OSD directive to the Service Secretaries to conduct indepth review of their installations and activities with the objective of developing new base realignment proposals, the DARCOM Plans and Analysis Directorate prepared three volumes of baseline data on each of DARCOM's over 200 activities and

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installations. Each activity format contained a description of the mission, strength, funding level, physical space, capital equipment value, and ADP support of that element with an analysis of the feasibility of consolidating, relocating, reducing, or disestablishing the activity. The baseline data and realignment recommendations on 156 separate activities and 68 installations were forwarded to DA in June 1977. DARCOM nominated the following 10 installations or activities for further detailed study:

| <u>Installation/Activity</u> | <u>Proposed Action</u> |
|------------------------------|------------------------|
| Eustis Directorate, AMRDL | Disestablish |
| Dugway | Standby |
| Jefferson | Standby |
| Sharpe | Standby |
| EMRA | Disestablish |
| ALMSA/LSSA | Consolidate |
| AMETA/ALMC | Consolidate |
| Pine Bluff | Contract |
| Lima | Contract |
| Pontiac | Contract |

Public announcement of those approved by DA for further study was expected in early 1978.

Candidate Realignment Studies

(U) In April 1976, the Department of the Army directed the major field commands to conduct studies of proposed organizational realignments selected by elements of the DA Staff. Five of those selected were DARCOM Organizations. Two of these (Savanna Army Depot and Jefferson Proving Ground) were completed and submitted to DA for approval prior to the start of this reporting period.

(U) Tool Set Assembly. A Case Study and Justification Folder was submitted to HQDA (15 Apr 77) which examined the various alternatives of retaining the mission of assembling certain common tool sets at Rock Island Arsenal as-is, retaining it at RIA with plant modernization there, contracting the work at RIA, or transferring the workload to another depot. Final determination of the action had not been made at the end of FY 1977.

(U) Consolidation of Aircraft Depot Maintenance. DA directed that we consider consolidating all Aircraft Maintenance at New Cumberland or Corpus Christi. In addition, DARCOM interjected two other alternatives: one being consideration of contracting out CH-47 work now done at NCAD and the other, utilizing the Navy at Cherry Point to accomplish CH-47 overhaul. The study which examined these alternatives,

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and which was submitted to DA over a year ago, concluded that using the Navy was not practical because their overhaul facilities were already fully utilized. The study also concluded that consolidation at New Cumberland was not economically viable because of facility cost which would be incurred. While the study also concluded that consolidation of aircraft overhaul at Corpus Christi, and contracting of CH-47 did not appear economically advantageous, it was pointed out that changes were anticipated which might make either of these options viable. These anticipated changes were a reduction in aircraft maintenance workloads and changes in the methodology of computing in-house operating costs. It was recommended to DA that the alternatives which considered consolidation at New Cumberland and utilizing the Navy to perform overhaul be dropped from further consideration and that consolidation at Corpus Christi and use of a contractor for CH-47 work be pursued. DA agreed and directed that a detailed analysis be accomplished in the form of a Case Study Justification Folder. This analysis was prepared and submitted to DA on 2 September 1977. This headquarters strongly recommended that no action be taken at the time and that as the above mentioned product improvement programs were initiated, DARCOM could then move toward performing all organic aircraft maintenance at CCAD.

(FOUO) Selfridge Air National Guard Base (SANGB). At Selfridge, TARCOM is a tenant and has had responsibility for the housing, Community Services, and other miscellaneous activity. DA directed that DARCOM consider closing out the housing and associated activities or contracting out the entire responsibility. The Concept Study concluded that closure was not practical but contracting out was a feasible alternative. After DA's review of the study, DARCOM was directed to solicit bids and, if contracting was found to be the most economical, to proceed with contracting the operations. DARCOM was following that direction when ASA(I&L) identified Selfridge as a candidate for minority small business (8(a)) contractors and directed that DARCOM utilize an 8(a) contractor. Subsequently, the 1978 DOD Appropriation Act placed a moratorium on contracting out certain types of functions. On 23 September, DA directed DARCOM to prepare a solicitation package to contract for real property maintenance and repair functions at SANGB.

Project DECI

(U) As a result of the Department of the Army Intelligence Organization and Stationing Study, this command assumed organizational control of the US Army Electronics Materiel Readiness Activity (EMRA) located at Vint Hill Farms Station, Warrenton, Virginia on 7 February 1977. When the Department of the Army approved the EMRA transfer from the (then) US Army Security Agency (ASA), DARCOM was requested to

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develop a concept for relocating and integrating the EMRA with other DARCOM organizations. Initially the concept study examined integration portions of Electronics Depots, EMRA, US Army Electronics Command, Communications Security Logistics Activity, and ASA (now termed US Army Intelligence and Security Command). The short title was Project DECI.

(U) Accordingly, DARCOM completed an in-depth study which assured that there would be no Electronic Warfare/Signal Intelligence materiel logistics support degradation and recommended that: (a) By Fiscal Year 1980, the EMRA secondary items/repair parts management and funding would be brought into the same modes utilized by other DARCOM wholesale supply managers. This action would permit inventory management and funding to be integrated into the standard DARCOM automatic data processing system; (b) By Fiscal Year 1982, the EMRA National Inventory Control Point, the National Maintenance Point, its procurement organization, and other related elements would be relocated and integrated into the US Army Communications and Electronics Materiel Readiness Command (CERCOM), to be activated from the current US Army Electronics Command in Fiscal Year 1978, at Fort Monmouth, New Jersey; (c) By Fiscal Year 1982, the EMRA depot organizational elements would be relocated and integrated into the US Army Depot System Command; specifically, at Tobyhanna, Pennsylvania. If higher authority approves Project DECI, DARCOM intended to move carefully with the proposed action to assure the Army in the field and National Users that there would be no support degradation.

Single Manager For Conventional Ammunition

(U) On 7 September 1976, the Deputy Secretary of Defense approved the assignment of the Army as the Single Manager (SM) for Conventional Ammunition. In turn, on 1 October, the Commander, US Army Armament Materiel Readiness Command (formerly US Army Armament Command) was appointed the Single Manager designate with full DARCOM staff authority.

(U) The major objectives of SM, as cited in the implementing directive (DODD 5160.65, Single Manager Assignment for Conventional Ammunition) were to: integrate conventional ammunition logistics functions of the Military Departments to the maximum extent practicable thereby eliminating unwarranted overlap and duplication; and achieve the highest possible degree of efficiency and effectiveness in the DOD operations required to provide top quality conventional ammunition to US forces during peacetime and mobilization.

(U) During the year, the SM implementation plan had been in the transition stage, getting ready for Phase I implementation on 1 October 1977. Phase I was to consist of the Army taking over command and

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control of the Hawthorne, Nevada and McAlester, Oklahoma Naval Ammunition Depots. The facilities utilized in the conventional ammunition functions at Naval Weapons Support Center (NWSC) Crane, Indiana, were to be assumed by the SM. The functions consisted primarily of production, quality assurance, renovation, demilitarization, and inventory. An Army Ammunition Activity would be established at Crane with the Navy providing support services under the terms of a Host/Tenant Agreement.

Printing and Duplicating

(U) As of the end of September 1977, Headquarters, DARCOM, its major subordinate commands and various other field activities were supported by 24 franchised field printing plants and 39 duplicating facilities. The reorganization of DARCOM resulted in some consolidations and deactivations; however, the total number of facilities remained relatively the same. The Joint Congressional Committee on Printing established a policy providing for maximum use of GPO Regional Procurement Offices for all commercially procurable work regardless of whether or not the work could be accomplished in-house. This policy has resulted in uncertain delivery schedules, loss of quality control and in some plants, under utilization of equipment with attendant increases in operational costs.

(U) In May 1977, a coordinated budgetary program was introduced by TAGO for procurement of printing and binding equipment. All commands were required to forecast their requirements two years in advance with the forecast being used to establish a firm budget. In the interim, local O&MA funds were required for any new or leased equipment. In spite of this restriction, approval was obtained for \$931,836 in new equipment requested by DARCOM printing facilities.

(U) The headquarters duplicating facility located in-house provided 10,900,000 printed pages and an additional 5 million pages were printed at Letterkenny Army Depot in direct support of Headquarters DARCOM. During this same period, 74 million pages were processed through TAGO for commercial procurement. This volume represents Army-wide publications and blank forms for which Headquarters DARCOM has proponency.

(U) The total cost of the DARCOM-wide printing and publications program for FY 1977 was \$24,006,006. Based on a normal 12 month year this figure reflects an increase of \$3,175,032 due primarily to the increased cost of labor and supplies. These costs included \$18,323 - commercially procured by DARCOM field activities, \$10,286,200 - for orders placed through TAGO to GPO by Headquarters DARCOM for DARCOM, DA, and DOD publications, \$10,497,297 operational cost of DARCOM field printing plants and \$3,204,186 operational cost of DARCOM field duplicating facilities and this headquarters.

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1977 Security Assistance Highlights*

Reorganization

(U) The approved Army Security Assistance Program Study (TASAPS-77) resulted in reorganizations and functional realignments within the Department of the Army (DA). On 1 November 1977, DARCOM became the DA Executive Agent for Security Assistance. Concomitant with this action, USAILCOM was redesignated as USASAC and assumed operational type mission responsibilities previously performed by the Coordinator for Army Security Assistance (CASA) and the DCSLOG International Logistics Directorate. This reorganization of USASAC was begun on 21 October 1977 and was being phased over several months. Included in the Executive Agent Charter are the following major assignments to DARCOM: The Commander, DARCOM, was named as the DA Executive Agent for the management of FMS cases and MAP/IMET; the DARCOM Comptroller was to provide military service review for FMS cases concerning such areas as non-recurring costs and firm fixed price sales. The USASAC was to: interface directly with the Defense Security Assistance Agency and foreign clients relative to security assistance program management; coordinate FMS and MAP requirements which cross functional responsibilities of other MACOM's and field activities and task as appropriate to fulfill approved program commitments; review security requirements including exceptions to National Disclosure policy; deal directly with OSD on routine munitions export control and commercial availability cases; and ensure total package approach utilization where necessary.

(U) A significant milestone occurred on 9 January 1978 when personnel from DA were detailed to USASAC pending formal job transfer actions. Of the 24 spaces being transferred, eight action officers and one clerk-typist accepted the detail to USASAC. The remaining 15 spaces (12 civilian, 3 military) remain vacancies. Memorandums of Understanding have been developed and were in final staffing process to depict the interrelationships between DARCOM and TRADOC and the US Army Communications Command.

Financial Management Improvement

(U) In September 1976, DOD established the Security Assistance Accounting Center (SAAC) in Denver, Colorado, to execute all SA financial assistance management for the Services. As a part of this

*Material in this section is taken from letter, DRCDS, BG Tom H. Brain, Commanding USASAC to DARCOM Command Group and Selected Staff Offices, 17 Feb 78, Subj: 1977 Security Assistance Highlights.

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effort, an audit of case files was performed to facilitate centralized billing, collection, and accounting for FMS. This action insured an effective and accurate transfer of case data and actual trust fund cash. Personnel from DARCOM, USASAC, commodity commands and depots were utilized during the audit. Audit results were reviewed by DARCOM and USAAA personnel prior to transfer of actual case files. Copies of all audited case files transferred are retained in the Financial Accounting Division files. The audit and transfer consists of three phases: (1) Audit and transfer of the "big three" countries and their trust fund balance. This phase started in September 1976 and was completed in November 1976 with the transfer of 1,260 case files and \$825 million trust fund balance to SAAC. This phase was under DARCOM Internal Review leadership and included only Israel, Iran and Saudi Arabia cases. (2) Audit and transfer of the remaining countries and transfer of the USAFAC trust fund balance to SAAC. This phase started in January 1977 and was completed in October 1977 with the audit of 86 countries and transfer of 5,037 case files. This phase was accomplished under the leadership of USASAC Internal Review. It included the audit of 208 "retained" cases from the "big three" countries which were not transferred during Phase I. The USAFAC trust fund balance of \$1 billion was transferred to SAAC and a memorandum trust fund adjustment account of \$21 million established by COA for audit purposes. This was the difference between the DD Forms 645 and USAFAC trust fund balances. (3) Residual actions required to effect necessary adjustments to audited case files and final voucher adjustment to the audited trust fund balance. This phase started in November 1977 and was in progress at end of year. This included the audit of approximately 150 extended credit cases which were not part of the trust fund balance and the identification and research of required adjustment actions noted in audited case files sent to SAAC. This phase included Internal Review research of accounts payable, accounts receivable, and FK adjustments and subsequent Financial Accounting Division preparation of documents required to effect necessary adjustments at SAAC. This phase would include all residual actions remaining in the transfer effort and the final journal voucher adjustment to the trust fund balance.

Saudi Arabian Army (SAA) Two Brigade Mechanization Program

(U) At the request of the Saudi Arabian Government (SAG), a DOD Survey Team visited Saudi Arabia in 1974 to evaluate defense requirements and make recommendations to improve their military defense posture. One of the important recommendations was to mechanize four infantry brigades. On 15 October 1975, Prince Sultan, Minister of Defense and Aviation (MODA), requested a complete offer for equipment to outfit two Mechanized Infantry Brigades. Based upon this mechanization recommendation and a SAG request, an immediate requirement for 13 Foreign Military Sales Cases (referred to as the

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Urgent Requirements List (URL) was developed to provide major items of equipment to the SAA. In order to roundout the two Brigades, the SAA requested an additional 533 materiel lines. By March 1976, requests for additional support equipment resulted in a total of 39 Roundout List Cases. These cases were implemented between 1976 and 1977 with the exception of eight cases. The total number of cases implemented to date is 44 with a program dollar value of \$575.6 million. The remaining eight cases not yet accepted are valued at \$61.3 million. Equipment deliveries began in 1976 and are scheduled to continue through 1979. A special project, referred to as ELO, was established to provide 10,536 lines of CSP and other equipment support for the initial M113 Armored Personnel Carriers and M60A1 Tanks which were delivered on an expedited basis to facilitate training for the initial SAA Brigade.

(U) Major items involved in the Two Brigade Mechanization Program are M109A1; M60/M113; DRAGON; LAW and REDEYE. Mobile Training Teams (MTT), Quality Assurance Teams (QAT) and Technical Assistance Field Teams (TAFT), as applicable to the major items, are coordinated to equipment delivery schedules.

(U) The Mechanization Program is appraised every six months thru Program Reviews attended by principal managers of major program elements from the following agencies: DA, DARCOM, USASAC, TRADOC, USAIMA, the MRC's (Materiel Readiness Commands), and in-country representatives from USMTM and DIVENGR. During 1977, two Mechanization Program Reviews were held at New Cumberland, Pennsylvania (May 1977 and December 1977). The December review was expanded to include representatives from DESCOM, as well as increased representation from the previously mentioned agencies. The Chief, USMTM expressed his desire to hold the next (fourth) Mechanization Review in-country and to include Saudi Arabian personnel in the discussions. USASAC plans to continue to monitor major item and supporting equipment deliveries in accordance with the terms of accepted FMS case delivery schedules. In addition, USASAC plans to provide liaison, as required, with TRADOC to assure that MTT's and TAFT's are in-country and possess sufficient support materiel to preclude delays in training. USASAC has communicated with USMTM to initiate planning for the Fourth Mechanization Review which is tentatively planned to be held in Saudi Arabia during the May-June 1978 time frame. USASAC was awaiting instructions from USMTM regarding an agenda to enable detailed preparation, by CONUS agencies, for the meeting. Special problems such as surfaced at the Third Mechanization Review (i.e., REDEYE Trainer Lease to the SAA and return of M109A1 howitzer battery leased to the SAA) were being handled expeditiously by USASAC. Continuous monitoring of materiel/training cases supporting mechanization in all phases was being conducted by USASAC. The USMTM representatives indicated during the December 1977 review that the mechanization program is proceeding on the Saudi Arabian schedule with no major problems.

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Jordan Air Defense Program

(C) The Jordan Air Defense Program consists of 14 I-HAWK Batteries, 100 Vulcan Air Defense Systems (VADS), training and services to include program management. The program dollar ceiling was established as "not to exceed" \$540 million dollars. The basic VADS case was accepted in August 1975 and implemented in January 1976 with the basic VADS training case being accepted in December 1975 and implemented in December 1975. Due to a delay in receipt of third country funding for subject program, a work stoppage was initiated on the I-HAWK portion of the program in April 1976. The problem was subsequently resolved and supply, services and training actions resumed in September 1976.

(U) A review of the total program was presented to the DA staff in April 1977. The presentation reflected the current status and future plans for the program to include a separate presentation on communication equipment (AN/TRC-145) for the I-HAWK program. These presentations were made to the Jordanian Armed Forces during a US-Jordan Joint Military Commission Meeting at HQDA in April 1977. An I-HAWK Program Review was held with customer, Program Management Office, and USASAC representatives in June 1977. The total I-HAWK Program was reviewed which resulted in revised requirements and additional requirements for Letters of Offer for roundout equipment. There were 28 cases associated with the I-HAWK Program of which 18 have been implemented with a total value of \$329.5 million. There were 12 VADS cases of which nine have been implemented. The value of implemented VADS cases was \$94.2 million.

(C) The first 36 VADS were shipped in increments of 12 each beginning in November 1976 with the last increment being shipped in April 1977. The balance of 64 were being supplied from procurement with delivery scheduled for the first half calendar year 1979. The first shipment of I-HAWK support materiel and 86 missiles were delivered during July 1977. The first three Battery Sets were delivered in August, September and December 1977, respectively. The balance of 11 sets were scheduled for delivery one each month: June, August, October and December 1978; February, April, June and August 1979; January, March and May 1980.

(U) To provide interim communication for the I-HAWK batteries, a loan agreement with associated FMS Case and depreciation charges under Grant Aid was implemented in September 1977. Loaned items are to be returned upon provision of the AN/TRC-145 system. The loaned equipment (AN/TRC-117) was delivered in December 1977.

(U) USASAC was to continue preparation of eight I-HAWK cases and implementation of two I-HAWK and three VADS cases upon receipt of customer acceptance.

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Administrative Service Center, Saudi Arabia

(U) On request of the Ministry of Defense and instructions contained in Saudi Arabian FMS case URK approved in January 1976, this activity provided a total plan for the establishment of an Administrative Service Center at Riyadh Saudi Arabia. The plan was designed to provide a printing plant, a publications depot and a supply depot to support the overall operation and large enough to support the Saudi Arabian Armed Forces for at least the next ten years. The plan included structural layout of the buildings, utility requirements, organizational structure, administrative procedures, personnel and equipment requirements for each administrative and functional element. A training program was also included to run concurrently with building construction to insure a qualified work force at both the management and operational levels. The total plan was prepared by the DARCOM Publications Officer and reviewed by the Department of the Army, Department of Defense and the State Department. With minor changes it was reproduced and handcarried to Riyadh Saudi Arabia where it was translated into Arabic and on 4 May 1977 it was formally presented to General Othman Al-Hmeid, Chief of the General Staff and Major General Ibrahim Al-Faris, J4, Saudi Arabian Armed Forces. The plan which included an architect's conception of the new building and drawn in true mid-eastern style was enthusiastically received by the generals who formally accepted it for the Ministry of Defense of Saudi Arabia. They advised that the plan would be referred to their Council of Ministers for final review and implementation, a process expected to require several months. Formal acceptance of the plan to establish an Administrative Service Center at Riyadh Saudi Arabia brought to a successful conclusion the mission of this activity to support Saudi Arabian FMS Case URK.

Iran Air Defense Program

(U) In July 1972, Iran Air Force purchase 10 complete batteries of I-HAWK. Subsequently, 92 FMS cases associated with I-HAWK were accepted. The program, as of February 1977, included 37 batteries, TO&E equipment, 1811 missiles, 7 AN/TSQ-73 Battery Control and Coordination Systems, I-HAWK On-the-Job Training(maintenance) conducted by Raytheon Educational Systems Company (RESCO) and pending acceptance, On-the-Job Training for the AN/TSQ-73 system (Litton). The program was valued at \$803 million. Iran planned to use two batteries for training and three for maintenance float. The remaining 32 batteries and AN/TSQ-73 systems were tactically deployed to permanent and/or temporary sites or to storage. All I-HAWK shipments were package shipments including a complete set of battery hardware, support equipment and spare parts support. Additionally, a Quality Assurance Team was provided with each shipment. The program included in-country operator/maintenance training of approximately 3,000 Iranians.

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(U) The I-HAWK Project Manager (at MIRCOM) had overall responsibility for program implementation. In-country program management was provided by the Peace Shield Program Manager with a staff of various specialties. MRC's with case manager responsibility include CERCOM, ARRCOM, TARCOM, TSARCOM and USASAC (NCAD) as well as MIRCOM. Program monitorship/supervision was being provided by USASAC with DA ODCSOPS having primary responsibility for in-CONUS training and TAFT support. The program was originally scheduled for completion by December 1979. However, the current conclusion by all concerned, because of additional requirements for training and follow-on support, was that the program would not be completed until December 1982.

Iran - Aviation Program

(U) In 1970, the Shah of Iran announced that the Imperial Iranian Ground Forces (IIGF) was to be supported by a modern Army Aviation force. The aviation program to support this decision included the acquisition and delivery of helicopters/concurrent spares, instructor and pilot training, and construction of related facilities. Since 1972, the Government of Iran has purchased a total of 1427 helicopters - 584 under Foreign Military Sales, 443 on direct contracts with commercial sources and 400 from co-production. Delivery of all the helicopters purchased under FMS was expected to be completed in February 1978 with the exception of six each for the Iranian National Geographic Organization.

(U) In April 1974, two FMS service cases covering flight training, technical training and logistics department operations were signed by the Government of Iran (GOI). Sole source procurement from Bell Helicopter International (BHI) was directed by the GOI. Both cases were for a four year period starting in April 1974 with a scheduled completion date of April 1978 at which time the GOI would assume the management and operation of the Imperial Iranian Army Aviation Training Center and Logistics Center.

(U) During 1977, the total dollar value of the Aviation Program reached \$1.8 billion. The two service cases were extended through September 1981 and another service case was accepted for additional field tactical and logistics support with a completion date of September 1981. In October 1977, a modification to the logistics service case (case designator WAL) was prepared by TSARCOM which increased the case value approximately 103%. After an evaluation by DARCOM which questioned the price increase, the modification was withdrawn by Commander, TSARCOM for further study. The Commander, DARCOM was furnished fact sheets and received briefings on the price increase to case WAL in November and December 1977.

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Antitank Weapons and Supporting Mobile Training Team (MTT) for Ecuador

(U) An American Embassy message dated 1 November 1976 from Quito, Ecuador to the Secretary of State cited the US Ambassador's concern about deteriorating US relations with the Ecuadorian Army. In essence, the Army Commander had complained strongly that the US Army had not been sufficiently responsive to his materiel requirements and student training, therefore, would no longer be permitted in CONUS schools. Hoping to retain a working relationship with the host country Army, which the Ambassador considered essential to a US overall bilateral relationship, the Ambassador requested a token impact shipment of antitank equipment plus ancillaries and a supporting MTT before the end of 1976--all on basis of political circumstances. The materiel package, consisting of 90mm Guns, 106mm Recoilless Rifle and LAW Rockets with supporting ammunition, was developed by the US Army mission in Ecuador. On the basis of supporting data developed by USASAC, execution of the requirement was directed by STATE/DEFENSE/DA within 16 days of the basic request. Subsequently, the following actions within accelerated time frames are noteworthy: price and budgetary data preparation and dispatch to country (5 days); request for Letter of Offer (LOA) from Ecuador (2 days); preparation of materiel LOA and release to country (11 days); country acceptance, funding and case implementation (9 days); materiel assembly and inspection (26 days); and delivery from depot to country (4 days).

(U) The total completion of the impact shipment for Ecuador in 73 days was an outstanding accomplishment that required dedicated interest, immediate responsiveness, and coordinated, efficient performance throughout DSAA, DA, USASAC, ARRCOM, numerous depots (both DARCOM and DOD managed) and the US Air Force. Case value was \$592 thousand. Ambassador Bloomfield cabled personal thanks to SECSTATE, SECDEF, and CDR DARCOM for the quick response by all concerned. He added that US Army actions were directly responsible for achieving desired US goals and called the action a positive contribution to US-Ecuador bilateral relations.

Expedited Shipments to Zaire

(U) On 12 March 1977, DA directed DARCOM to prepare uniforms, field gear, rations, fuel bladders, communications equipment, and medical supplies for expedited delivery to Kenshasa, Zaire, in support of emergency requirements. Additional requirements for personnel equipment/support, vehicle support, and communications equipment were received intermittently through June 1977.

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(U) Rapid responses were experienced relative to all requirements due primarily to the excellent cooperation and extraordinary efforts expended throughout the support system. As an example, the initial request for this project was received by DARCOM at 1300 hours on 12 March 1977; cases were prepared and forwarded for customer signature by 1900 hours on 12 March 1977; materiel was stored in a "pick/pack/hold" status as of 1400 hours on 13 March 1977; Ambassador of Zaire signed cases on 14 March 1977; cases were implemented and supply sources were directed to position materiel at Dover AFB on 14 March 1977; the initial SAM flight departed Dover at 2049 hours on 16 March 1977 with touchdown in Kenshasa, Zaire at 1455 hours (est) on 17 March 1977. During the period March-July 1977, approximately 1½ million pounds of materiel were airlifted to Kenshasa through use of 16 SAM flights and 15 MAC channel flights. The total value of shipments was in excess of 4 million dollars.

Portugal

(U) Since early 1976, General Haig had spearheaded an effort to have various NATO nations provide materiel to equip a mechanized infantry brigade committed to NATO. An example of the multi-national effort was the Federal Republic of Germany's (FRG) approval to finance through FMS the costs of upgrading 18 M48A5 tanks which had been upgraded at Anniston. The US tank inventory would be replenished with 18 M48A2C tanks which were excess to the needs of the FRG. The US effort was being done incrementally as Grant Aid appropriations became available. The uncertain availability of Grant Aid appropriations from year to year caused management of the program to be prolonged and complex. This fact, plus the high-level political interest, caused USASAC to give extraordinary management to the program.

(U) The initial effort of the US Army was delivery of five M48A5 tanks, 20 M113A1 APC's, and associated ancillary equipment and ammunition in June 1976. This equipment was placed on loan for one year and MAP funds were used to cover the loan fees. During the summer of 1977, the loan was extended through September 1978. The US Army's ongoing effort stemmed from a listing of needed equipment finalized by the MAAG in March of last year. This listing was prepared within parameters which were established based on an estimate of Grant Aid funds Congress would make available. The total tri-service program for FY 1977 was \$32.3 million; the Army portion was \$15.4 million. In addition, the Army had \$10.7 million of the \$25 million FY 1978 program. Between April and the first of November 1977, there were ongoing actions such as determining source of supply and requesting diversion authority; however, supply action was held in abeyance until the FY 1978 Security Assistance legislation was signed

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into law in late October. Shortly thereafter, USASAC was directed to move as much of the equipment on the April 1977 listing to country as soon as possible. In order to accomplish this a ship was scheduled and great effort was expended to ship and consolidate as much equipment as possible at Bayonne. The primary items of equipment shipped were armored personnel carriers, trucks, electronic equipment, and ammunition.

Morocco Army Modernization Program

(U) In 1971, the Government of Morocco (GOM) expressed a desire to equip two Brigades of the Royal Moroccan Army (RMA) with US equipment. Official requests were received September 1974. The initial requests included: M48 tanks, M113 Family Vehicles (APC's, mortar carriers, command posts, ambulances), VULCAN, TOW, Chaparral, FAAR M88A1, and M578A1 Recovery Vehicles. Later, additional requests included Dragon, additional M88A1 and M578A1 Recovery Vehicles, more M113 Vehicles, 155mm Howitzer SP and a greater number of TOW and VULCAN. In the wheeled vehicles area, GOM requested tankers, cargo trucks, dump trucks, wreckers, GOM vehicles, shop vans, 1/4 ton trucks with TOW mounted, and 106mm RR mounted. Some communications gear was also included. The requests for the wheeled vehicles and some of the communications equipment was subsequently cancelled and procured via commercial means. To date (Feb 78), GOM had received 54 M48A3 and 54 M48A5 tanks, the majority of the M113A1 Family Vehicles, M578A1 Recovery Vehicles, TOW system and TOW mounted M113's. The value of the Army portion of the GOM Modernization Program exceeded \$350 million at that time. A Chaparral training package, initial increments of the VULCAN system, and the 155mm Howitzer SP would be delivered 1Q CY 78. The remainder of the VULCAN requirement would be delivered during 2Q CY 78. The balance of the Chaparral and the FAAR was scheduled for delivery in October 1978. The Dragon and M88A1 Recovery Vehicles were estimated to be delivered in CY 1979.

Saudi Arabia National Guard (SANG)

(U) On 19 March 1973, the Saudi Arabian Government (SAG) and the United States Government (USG) signed a Memorandum of Understanding (MOU) addressing the modernization of the Saudi Arabia National Guard (SANG). Within the terms of the MOU, the USG agreed to modernize four SANG mechanized infantry battalions (MIB) to include organizing and training the SANG, providing major items and support equipment, services, logistical support, weapons, ammunition and other materiel. Additionally, the USA Corps of Engineers agreed to manage all construction projects associated with the SANG program. The overall program was established for a five year period which is currently scheduled to be completed in January 1980.

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(U) The SANG Modernization Program has been managed by a DARCOM Project Manager and his staff located in Riyadh, Saudi Arabia. The Program Manager's Office (PMO) was comprised of 75 personnel spaces of which 71 people were in country and four were in the Washington Field Office. The PMO was assisting the SANG in training a ready striking force for the sustained defense of the Kingdom of Saudi Arabia. Additionally, the PMO managed three contractors: Vinnell, Cadillac Gage and General Electric who provide training and support personnel in-country to assist in the modernization effort.

(U) In April 1974, the SANG signed a Letter of Offer and Acceptance (LOA) for Master Sales Case ZAC (\$272.33 million). This case was used as a holding account to finance sub-cases which provide equipment and services to the SANG. In November 1976, the SANG signed an amendment to Master Sales Case ZAC which established the program level at \$487.93 million. The increased costs were a result of price escalation and modifications to the organizational structure of the program. There were approximately 41 active sub-cases providing major items, ancillary equipment and services. The 1st and 2d MIB's completed training on schedule in 1977.

Korea - Improved HAWK Program

(C) In their defense planning priorities, the Republic of Korea places their air defense program second only to their armor and armor defense capability. The HAWK has been a vital part of this program. The effort to upgrade ROK Basic HAWK (BH) battalions to Improved HAWK (IH) and to increase the number of HAWK battalions from three to five was at end of 1977, the ROK's highest valued US Army managed FMS program. At the time of projected program completion in 1982, the total value was expected to exceed \$220 million.

(C) As presently envisioned, the BH to IH conversion program will provide the ROK with five IH battalions by the early 1980's. This included a conversion/procurement/transfer plan which could be summarized as follows: BH major equipment for IH Battalion One was converted in US depots. This equipment, plus IH missiles, contractor services (primarily from Raytheon Corporation), and new equipment training was furnished to the ROK during early 1977 and the last battery of this battalion reached operational status 23 December 1977. A problem involving potential support item shortages was addressed in two memorandums from the DARCOM Director, Security Assistance to the DARCOM CG in November 1977. Battalions Two and Three were to be converted in Korea through use of an in-country depot level maintenance complex. The Letter of Offer for conversion kits, concurrent spare parts, training, and other support materiel and services was accepted

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and was implemented 20 September 1977. Due to item lead times up to 33 months, conversion of these battalions is expected to occur from late 1979 through early 1981 and Battalions Four and Five were to be established through missile and equipment transfers from US assets in-country. The request for an offer for these battalions had not been received as of 27 January 1978.

(U) There were several areas of concern in the ROK IH program. Among these were the shortages of ROK IH trained personnel; the readiness of support facilities, including the missile maintenance depot; the impact on US forces of possible diversions or outright transfers from US assets for battalions two through five; and the availability of secondary and other items to provide initial support loads and maintain battalions in an operational status while skills and supply pipelines were being developed. These areas of concern were expected to continue to require careful planning and close coordination between USASAC, MIRCOC, HAWK Project Office, JUSMAG Korea, and others involved in the program. The ROK HAWK Program would be an important item on the agenda of the US/ROK Security Assistance Review which was being planned during late April 1978.

Vulcan Air Defense System (VADS) M167 - Republic of Korea (ROK)

(U) In 1973, Technical Data Packages for VADS were furnished country on an FMS case for feasibility study, production of repair parts to support the system and subsequent in-country production. In 1975, 88 each, Towed Vulcan Systems, M167 were issued to country under the Grant Aid Program. Repair parts and repair and return have been supported under Blanket Open End (BOE) cases.

(U) In May 1976, country requested USG for authorization to produce 500 VADS in-country. In August 1977, the authorization was approved to produce the system for indigenous use only. An export license was also granted in June 1977 to furnish radars, peripheral equipment, production equipment and technical assistance in connection with the electronic components of the Vulcan System.

(U) On 7 October 1977, the ROK requested a Letter of Offer and Acceptance (LOA) for all of the Vulcan Product Improvement Program (PIP) modifications. The LOA was written to list each modification by separate line number with cost per system. ARRCOM advises that all repair parts and components furnished under BOE cases have included latest PIP modifications, therefore, it would be difficult for the country to acquire modified components without duplicating some components already contained in their systems. However, ARRCOM prepared a LOA IAW country request under Case VGE which was released to country on 12 January 1977. Total dollar value of the case \$3.3 million and estimated delivery lead time for items included in case was 18 months after case was accepted, funded and implemented.

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Korea - Aviation Program

(U) The Republic of Korea was supplied 314 observation, utility, and trainer fixed wing aircraft. They have received 160 OH-23 or UH-1 model helicopters. The US Army/ROK FMS Aviation Program was evolving toward greater use of rotary wing aircraft, including those with a heavy lift capability.

(U) There were two significant programs active. Program one included 49 UH-1H helicopters, concurrent spare parts, general support equipment, and supplemental items. Twenty-two aircraft, plus all related items and equipment, were on an FMS case which was implemented on 6 December 1977 at a value of \$20.8 million. The remaining 27 aircraft were being supplied through Grant Aid funds which became available when the US Navy could not furnish the ships for which these funds were originally earmarked. This was the only US Army managed ROK program which included supply of defense hardware based on Grant Aid funds. The Grant Aid portion was valued at \$20.1 million. The first UH-1H helicopters were expected to be supplied in early 1980. Program two consisted of six CH-47C helicopters on an FMS offer, valued at \$40.1 million, which was forwarded to DA on 17 October 1977.

Korea - Nike Hercules (NH) Transfer

(U) A 1974 Secretary of Defense Program Decision Memorandum directed that equipment and missiles for six NH batteries be turned over to the ROK Army. These batteries were in the US Eighth Army inventory. The Army Master Data File value of this materiel was originally \$45 million. However, due to the age of the system, and resultant application of reduced pricing, the value of the FMS case which was developed for transfer of this materiel was \$6.2 million. Implementation of the case occurred on 17 June 1977 and where-is, as-is transfer was completed on 1 July 1977.

(U) Routine actions were still under way at MIRCOM, DSAA (SAAC), and USASAC to reconcile transfer documents with financial and accountability records. The transfer of NH is otherwise complete. Several requests for Letters of Offer were received from the ROK which called for NH missiles, antenna masts, director stations, and other items which complement or support items which were transferred. The ROK also took greater interest in the future of the system by participating in cooperative efforts to insure that continued operation would be practical. For these reasons, this program was expected to continue to generate FMS business for some time.

Korea - Honest John (HJ) Transfer

(U) Under Security Assistance Programs, the ROK had been supplied four HJ launchers, over two-hundred missiles and related items (one operational battalion). In January 1977, a request for an offer for one additional HJ battalion was received from the ROK. It was determined that weapons and equipment for one HJ battalion was being held in Eighth Army and possibly could be made available for transfer.

(U) Two Letters of Offer were developed to cover the transfer of the UH HJ battalion. The first, which included missiles, launchers, handling units, and other equipment peculiar to HJ, was accepted 17 August 1977. The value of the 21 where-is, as-is items on the offer was \$1.35 million. Transfer was completed 29 October 1977.

(U) The second offer included items not peculiar to an HJ unit such as compressors, binoculars, compasses, radios, trucks, and trailers. The 86 lines, valued at a cost of \$.8 million, on the offer have been accepted by the ROK Government. Case Implementation was effected 20 January 1978.

Korea - Tank Upgrade Program

(C) The ROK inventory of tanks included 421 M47's, 140 M48's and 280 M48A2C's. The M47 could not be logistically supported after 1980 because of repair part obsolescence.

(C) The M48A1 tanks were to be converted in-country to the M48A3 configuration (90mm Gun), with the exception of 40 each to be converted to M48A5 (105mm Gun). Phase B of the tank program would provide for the upgrade of the remaining fleet to the A5 configuration. This was in the planning and budgeting phase under preparation at TARCOM.

(C) Korea purchased 301 M48A1's. The last increment of 120 tanks was scheduled for delivery prior to August 1978. The US was providing complete program support, materiel, technical assistance and training through Foreign Military Sales. The program was on schedule with A5 tank production from December 1977 through September 1978 and the A3 tank production from September 1977 through December 1980. The total program value was \$1.4 million.

Republic of Korea Indigenous Tank (ROFIT)

(C) Under the Mutual Defense Assistance Agreement of 1950 between the ROKG and the USG, the ROK requested the US to provide technical and managerial advisory assistance in the design and development of a modern tank to be produced in Korea. A proposed Memorandum of Agreement (MOA) was provided to ROK on 29 October 1977. The MOA provided for a conceptual design study leading to development, assembly, and

testing of two prototype tanks. A Foreign Military Sales case was established to provide two M60A1 tanks from new production to be utilized by US industry in producing prototype tanks. This total program, to include a joint US/ROK Project Managers Office, was estimated to cost \$20.3 million. The ROKG was presently reviewing/evaluating the ROKIT MOA.

Republic of Korea (ROK) Artillery Manufacturing Program

(U) The ROK fabricated prototypes of the 155mm Howitzer, 105mm Howitzer, 4.2" Mortar, and 106mm Recoilless Rifles using Technical Data Packages obtained by Foreign Military Sales (FMS) transactions. During field use of these in-country fabricated weapons, a number of serious defects became apparent. In January 1976, a four man team of specialists from ARRCOM visited country to explore and evaluate the Artillery Manufacturing Program. The team attributed defects encountered to materiel type problems such as precision machining of components, and imperfect rifling of cannons.

(U) As a result of recommendations made by the Survey Team, the country requested a FMS case for training of indigenous technicians in US facilities. Since the items for which training was required were not currently being fabricated in the US, DARCOM recommended that USG technicians visit country to assist in the program and prepare FMS Case URW for this transaction. Total value of this case was \$32.055 million.

(U) Two teams of technicians, one from Watervliet Arsenal and one from Rock Island Arsenal visited Korea for a total period of five months during CY 1977 to assist the ROK in subject program. These teams indicated that several aspects of their program needed to be improved in order to produce quality weapons. The teams made several recommendations which included acquisition of additional equipment and update or modification of equipment on hand. However, the greatest problem proved to be the lack of basic machining skills which would require at least two years to develop. The most significant problem in machining the parts to US specifications was that when US prints were converted to their Korean language, all dimensions and tolerance were rounded off. Other problems concerned the non-availability of gages, tools, and blueprints. Also, adequate quality control was lacking as well as expertise in inspection procedures and supervision. Recommendations were made with regard to resolving above problems. During a visit by the Chief, Pacific Division USASAC to the ROK in November 1977, progress in the artillery manufacturing program was in evidence. The test firing of the ROK produced 155mm Howitzer proved to be very successful.

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Managing Environmental Quality

(U) The DARCOM Environmental Program has been a broad-based multi-disciplined effort encompassing environmental management, applied technology for pollution abatement and environmental enhancement, and research and development for solution of unique environmental problems. The Environmental Quality Office (EQO) of the DARCOM Plans and Analysis Directorate was the focal point for the command program, working closely with the environmental representatives within the functional directorates of the headquarters in everyday matters of environmental concern. The DARCOM Environmental Quality Committee, consisting of a representative from each DARCOM directorate, materially contributes to the management effort.

(U) DARCOM Regulation 11-5 required that commanders at each subordinate echelon appoint an environmental coordinator. The extent of implementation of this requirement was dependent upon the mission of the organization, ranging from separately identifiable offices with full-time staffs to single individuals functioning on a part-time basis. The completion of DARCOM reorganization into Readiness Commands and Development Commands was accomplished and environmental personnel have been identified in all commands, including Depot Systems Command and the depots reporting to that command.

(U) The quality of Environmental Impact Assessments (EIA) and Environmental Impact Statements (EIS) continually improved as more experience was gained by proponents and reviewers at each echelon. The main advantage of developing in-house expertise was that Commanders, principal decision makers and their personnel have become more environmentally aware and the costs for NEPA (National Environmental Protection Agency) compliance have been minimized. This policy did not, however, preclude the use of contracts or out-of-house resources when warranted by time or technical constraints.

The following is a listing of EIS's filed during this period:

| <u>TITLE & DESCRIPTION</u> | <u>DRAFT TO CEQ</u> | <u>FINAL TO CEQ</u> |
|--|---------------------|---------------------|
| Mississippi Army Ammunition Plant | | 29 Oct 76 |
| Chemical Agent/Munition Disposal System (CAMDS) | 23 Aug 76 | |
| HMX/RDX Expansion Facility | 10 Dec 76 | 24 Mar 77 (to DA) |
| Operation DTS, Movement of Chemical Materiel from DPT to Tooele Army Depot, South Area | 10 Dec 76 | 6 May 77 |

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| <u>TITLE & DESCRIPTION</u> | <u>DRAFT TO CEQ</u> | <u>FINAL TO CEQ</u> |
|---|--|---------------------|
| Supplement A to Disposal of Toxic Residue Disposal of M139 Bomblets at Tower Grid Holding Area, Dugway Proving Ground, Utah | | 24 Mar 77 |
| Operation Plan TNS; Movement of Chemical Materiel Tooele Army Depot (North Area) to Tooele Army Depot (South Area) | | 6 May 77 |
| Installation Restoration of Rocky Mountain Arsenal, CO, Part I - Pilot Containment | 22 Apr 77 | |
| Disposal of Chemical Agent Identification Sets at Rocky Mountain Arsenal, CO, Phase I - Pilot Testing | 22 Apr 77 | |
| Operation Plan RMT; Movement of Chemical Materiel, Rocky Mountain Arsenal to Tooele Army Depot | 27 May 77 | |
| Supplement C to Project EAGLE Phase II - Demilitarization and Disposal of the Wet Eye Bomb at Rocky Mountain Arsenal, CO | Presently being held at DA pending decision on disposition of Wet Eye Bomb | |
| Installation Restoration of Rocky Mountain Arsenal, CO, Part I - Pilot Containment Operations | | 29 Aug 77 |
| Disposal of Chemical Agent Identification Sets at Rocky Mountain Arsenal, CO | | 29 Sep 77 |
| Addendum to Disposal of Chemical Agent Identification Sets at Rocky Mountain Arsenal, CO | | 29 Sep 77 |

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Compliance With Applicable Air Quality Standards

(U) The Clean Air Act Amendments of 1977 shifted the responsibility for reduction of air pollutants from the Federal level to State and Local levels. The impact of this change had not been established but it would require that all federal facilities comply with state and local procedural requirements as well as meeting the performance standards they would propose. As soon as the public law became available, action was initiated to alert DARCOM Commanders of its potential impact so that resources could be allocated. As in past years, the DARCOM ammunition plants were the major source of air pollution. A major budgeting effort resulted in the initiation of corrective actions. Major polluters were Holston, Anniston, and Radford and approximately \$70 million was budgeted to correct these installations. Open burning of explosives and contaminated waste remained a major problem; however, new incinerator technology in the form of the MODIFIED APE 1236 with the air curtain was expected to result in major reduction in pollution from this source. These were interim solutions to the problem and may not fully meet emission standards. Long range solutions now under way are rotary kiln and fluidized bed incinerators as well as chemical and biological degradation of the material. In 1975, DA was requested to obtain Congressional approval to exclude all military designed vehicles from the requirements of the Clean Air Act. DA rejected the request in August 1977 and action has been undertaken to bring the M151A2, 1/4 ton truck into compliance when the current exemption expires on 31 December 1978. This was the only military truck under procurement which did not meet current emission standards.

Compliance With Applicable Water Quality Standards

(U) MCA projects were either under construction or had been budgeted for the correction of discharges into navigable waters from industrial and other facility waste sources. New problems relating to discontinued production activities surfaced which needed to be addressed. One example of this was the discovery of DDT which was dumped and buried by a contractor at Redstone Arsenal. This material leached into the Tennessee River and was present in the fish at a level approximately 80 times the permitted safe level. Similar situations existed at Rocky Mountain Arsenal and Pine Bluff Arsenal. DARCOM continued to work closely with the Project Manager/Chemical Demilitarization and Installation Restoration on these problem areas. Also, in other areas, Product Improvement Programs were developed and budgeted to accomplish the installation of sanitary devices and oil/water separators on all Army vessels prior to 1 April 1981 so that the Army fleet would be in compliance by that deadline date.

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Radiation Pollution Control

(U) During FY 1977, an extended project was undertaken relating to the burial of certain waste products in Lake Superior during the late 1950's. Commercial and private fishermen of the area reported to their Congressional representatives that nuclear material had been packed in steel drums and dumped in the lake. Radiation measurements did not reveal any increased levels; however, the reports became so persistent that ARRCOM was directed to investigate. Documentation revealed that approximately 1400 barrels of non-nuclear material was dumped into Lake Superior. Divers were contracted to locate and bring drums to the surface for examination. Despite a major effort, no drums were located and the investigation concluded that nothing was buried in the lake which was environmentally controversial. The final Report of Investigation, 8 August 1977, was released to the public and Congress.

Noise Pollution Control

(U) Several positive actions were accomplished during FY 1977 to abate noise. The firing range at Letterkenny AD was surveyed and a program established to minimize noise from test firings. A sound beam was constructed between the test track and a housing area at the Tank Production Plant at Warren, Michigan to reduce the noise emitted from the M60 Tanks being road-tested. The firing range at Aberdeen Proving Grounds has installed a rigid fire control plan to install noise measuring instruments to minimize weapons noise in the surrounding communities.

Toxic and Hazardous Materials Management

(U) Chemical agents and munitions were successfully moved from Dugway to Tooele and within Tooele Army Depot without incident. These actions were all preceded by formal EIS's and were well publicized and given wide news coverage. The Toxic Substances Control Act (TSCA), enacted 16 October 1976, was added to the Federal arsenal of environmental protection legislation to control certain types of pollutant at the source. EPA-proposed regulations suggest that, of some 30,000 chemicals, a maximum of 50 per year will be evaluated for elimination or control.

DARCOM Safety Program

(U) The DARCOM safety mission involves the provision of maximum safety consistent with operational requirements in the design of Army material; prevention of injuries to military, civilian, and contractor personnel; prevention of damage to Government property and interruption to essential operations; elimination from the environment of

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those effects of DARCOM operations which might otherwise represent a hazard to civilian populace; and exercise operational control over the DARCOM Field Safety Activity. To meet the mission requirements, the responsibility is divided into four functional areas: Aviation, Health Physics, Program Evaluation, and Research and Engineering.

Aviation

(U) During FY 1977, DARCOM conducted 10 aviation safety surveys of DARCOM activities/installations with aircraft assets. The results of these surveys were satisfactory. The United States Army Agency for Aviation Safety inspected eight DARCOM installations and the result indicated an excellent accident prevention program. Additionally, DARCOM participated in numerous airspace surveys and actions with the FAA when airspace above DARCOM property was involved.

Health Physics

(U) During FY 1977, 85 applications for Nuclear Regulatory Commission Licenses, 14 applications for DA Permits and 26 applications for DA Authorizations were processed.

Program Evaluation

(U) During FY 1977 the Program Evaluation Functional Area continued efforts to obtain funding for DARCOM projects intended to correct violations of the Occupational Safety and Health Act. These efforts resulted in the receipt from Department of the Army, \$786,000 in end-year funding for OSHA projects, money which was distributed to subordinate commands for the accomplishment of specific "OSHA Projects" which were based on the results of official safety and health inspections. During FY 1977, at least one program survey was performed of each command, installation or activity reporting directly to this headquarters. In addition, spot surveys were initiated of some commands two levels removed from DARCOM to assure that safety policy and guidance are being implemented. These surveys aid the commands by promoting a commonality of solutions to problems that are similar among all the commands as well as determine the level of compliance with appropriate Army safety regulations.

Research and Engineering

(U) During FY 1977, numerous site plan/safety submissions were reviewed by the Research and Engineering Functional Area. The approval of these construction plans, involving new and modified facilities for the production, testing, storage, and demolition of Hazardous Materials throughout DARCOM, required the coordination of this office, its field counterpart at DARCOM Field Safety Activity, DARCOM subordinate commands, and the Department of Defense Explosives Safety Board.

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(U) DARCOM continued its work in assigning hazard classifications to energetic materials and items. The work begun in FY 1976 of implementing the UNO system of hazard classification concluded with its inclusion into change 3 to the DARCOM Safety Manual, AMCR 385-100. In many cases, the assigning of hazard classifications required review of testing procedures to assure compliance with TB 700-2 in addition to careful analysis of test results. Coordination with the Navy and Air Force contributed to triservice uniformity in the area of hazard classification. The Department of Transportation was made aware of all hazard classifications assigned, as well as provided with the supporting test data in order to assure safe transportation of DARCOM hazardous materials over public highways.

(U) Change 3 to the DARCOM Safety Manual, AMCR 385-100 was published in March and distributed to all DARCOM subordinate activities in April. The major emphasis of this change was the incorporation of the NATO Safety Principles for the Storage of Ammunition and Explosives, as well as the UNO system of hazard classification. Work was initiated on a change 4 to the safety manual with an anticipated publish date in FY 1979. DARCOM responded to numerous requests for technical information from subordinate activities as well as higher headquarters.

(U) The DARCOM accident experience during FY 1977 was as indicated below:

ACCIDENTS, INJURIES, AND FATALITIES

| | <u>FY 76</u> | <u>FY 77</u> | <u>FY 77 PERCENT INCREASE (DECREASE)</u> |
|-------------------|--------------|--------------|--|
| No. of Personnel | 141,064 | 135,469 | (3.96) |
| No. of Accidents | 737 | 791 | 7.33 |
| No. of Injuries | 395 | 469 | 18.73 |
| No. of Fatalities | 11 | 15 | 36.36 |

FREQUENCY AND PER CAPITA RATE

| | | |
|-------------------------|---------|---------|
| Army Aircraft | 9.16 | 1.84 |
| Army Motor Vehicle | 2.03 | 2.01 |
| Active Army Personnel | 19.76 | 26.75 |
| Active Army Work Injury | 0.96 | 1.63 |
| Army Civilian Employees | 1.88 | 1.53 |
| Other Personnel | 0.90 | 1.36 |
| Accidents/1000 Persons | 5.22 | 5.84 |
| Injuries/1000 Persons | 2.80 | 3.46 |
| Cost per Capita | \$36.28 | \$36.47 |

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FIRES AND EXPLOSIONS

| | | |
|-------------------------|-----------|-----------|
| No. of Fires | 30 | 35 |
| Property Damage (Fires) | \$295,371 | \$167,110 |
| Total Expl Injuries | | |
| (Incl FataIs) | 2 | 9 |
| Explosion FataIs | 0 | 1 |
| Property Damage (Expl) | \$215,247 | \$224,538 |

DARCOM FATALITIES - FY 77

| <u>INSTALLATION</u> | <u>DATE</u> | <u>NO. & CLASS</u> | <u>ACCIDENT CATEGORY</u> | <u>DESCRIPTION</u> |
|------------------------|-------------|----------------------------|------------------------------|---|
| Yuma PG | 29 Oct 76 | 1 AA | POV | Collision |
| HQ DARCOM | 4 Apr 77 | 1 Civ 1 AA | Other | Comm Airline Crash |
| HQ MIRADCOM | 4 Apr 77 | 3 Civ | Other | Comm Airline Crash |
| USA Tropic Test Center | 24 Mar 77 | 1 AA | Other | EM Drowned |
| White Sands MR | 25 May 77 | 1 AA | AMV | Wrecker ran off road, pinned occupant |
| Sierra Army Depot | 29 May 77 | 1 AA | Other | Fell down mountain side |
| New Cumberland AD | 21 Jun 77 | 1 AA | POV | Motorcycle Accident |
| Natick Laboratory | 1 Jul 77 | 2 AA | POV | Ran off road |
| Lone Star AAP | 2 Aug 77 | 1 Conv | | Explosion |
| RD&E Dir | 15 Aug 77 | 1 AA | POV | Ran off road (on duty) |
| Volunteer AAP | 9 Sep 77 | 1 Conv | Other | Crane Accident |

Quality Assurance Management

(U) During FY 1977 several key reorganizations and position alignments were implemented to improve the responsiveness of the DARCOM Product Assurance Program. This past year also saw greater emphasis placed on assuring and achieving user satisfaction.

(U) Specific accomplishments in achieving a responsive and viable DARCOM Product Assurance Program in functional areas are highlighted in the summaries that follow.

Depot Maintenance Quality

(U) A DA/DARCOM Steering Group Review of Depot Maintenance Quality Brochure was published and distributed in January 1977. It

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highlighted 18 separate areas requiring improvement. A workshop was held in ANAD on 20-21 July 1977 to review progress that had been accomplished. Improvement actions have been initiated in the areas of DMWR's testing, planning, program management and the work force. Other areas requiring further action were identified to the Major Development and Readiness Commands and Depot System Command. The reconditioning programs for the M113 Personnel Carrier and the 1.5 KW 60 Hertz Generator were reviewed on-site by the DARCOM/DESCOM review team. The reviews were conducted at Mainz and Tooele Army Depots respectively.

Certification Program for Quality Assurance Personnel

(U) In February 1977, a special issue of the Product Assurance Bulletin devoted entirely to the Certification Program was published. DESCOM had 41 percent of its eligible quality assurance work force certified. Full implementation was scheduled for January 1978. Additional actions underway included final staffing and publication of DARCOM Circular 690-XX, Quality Assurance Certification Program, which would provide DARCOM's policy and program direction.

Maintenance Information System for Quality (MIS-Q)

(U) This ADP system was designed to improve depot maintenance quality. Through data collected, it would identify, track, or pinpoint quality problems or costs associated with an NSN, PCN, EIC/WAC, base operations area or work center. The MIS-Q system was tested at LSSA in January 1977. The first depot to receive MIS-Q was ANAD in March 1977. Subsequent to MIS-Q implementation at ANAD, it had been implemented at seven other depots and two depot activities. DARCOM-C 702-3, Maintenance Information System for Quality (MIS-Q), was in the final staffing channels with publication planned for early 1978.

QA Handbook for Performing Depot Quality Evaluations, DARCOM-P 702-1

(U) DARCOM-P 702-1 was developed to provide a basic outline and procedural guidance for the performance of quality evaluations of the depot quality assurance system. While the intent of the pamphlet is for depot use, it may be used by other DARCOM Quality Assurance elements in assessing the adequacy of depot operations for their assigned materiel.

DARCOM/DESCOM Joint Reviews

(U) A review team was established to determine DARCOM's progress in implementing the DA/DARCOM Steering Group recommended improvements in the depot maintenance process. The reviews center around specific equipment systems and cover the overall approach by the Major Readiness

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Commands and the reconditioning activity. The reconditioning programs for the M113 Personnel Carrier and the 1.5 KW Generator were reviewed on-site by the DARCOM/DESCOM Review Team. The reviews were conducted at Mainz and Tooele Army Depots, respectively.

Production and Post-Production Testing Policy

(U) Significant revisions to the Army policy governing Production and Post-Production Testing were made during the past year with the publication of AR 702-9 and AR 702-10. These newly published Army Regulations establish the basic policy and guidance for materiel testing during the Production, Deployment, and Operation Phases of the materiel life cycle. AR 702-9, Production Testing of Army Materiel (dated 7 March 1977); and AR 702-10, Post-Production Testing of Army Materiel (dated 29 July 1977) establish formal and disciplined management controls for assuring the continued fielding of quality materiel.

Materiel Release Program

(U) DARCOM Regulation 700-34 was revised and issued, dated 26 May 1977. It was recognized that the AMARC implementation (reorganizations to Development Commands and Readiness Commands) required more controls and coordination to insure the adequacy of released materiel. The revised regulation on Release of Materiel for Issue included such changes as: PM's reporting direct to DARCOM were required to supplement the regulation, the Development Commands and Readiness Commands must coordinate authorizations of releases, materiel must be held in Condition Code L at the Depots pending release decision and Full, as well as Conditional release authority was delegated to the Commands and PM's (reporting direct to DARCOM).

US Army Metrology and Calibration System

(U) Fiscal Year 1977 saw new developments and continuing improvement in the Army Metrology and Calibration Program. For example, DARCOM was tasked by DA to review the current concept of Army calibration and to recommend improvements to ensure program standardization, inter-service compatibility, efficient and cost effective service, and wartime responsiveness. A Senior Officer Review Board was established to provide direction and monitor study efforts. Alternatives were developed and analyzed and the study group's recommendations were coordinated with the MACOM's. Major study recommendations were that both of the present levels of calibration (Levels A and C) be consolidated with the TMDE repair function and that the overall program be managed/operated by a single command. Final reconciliation and confirmation of resource requirements was underway and the report was due to be submitted for HQDA approval in the first quarter FY 1978. If approved, this study

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was expected to result in considerable improvements to the Army program. Also, during FY 1977, the deployment of calibration equipment sets (AN/GSM-256 and AN/GSM-259) for the maintenance calibration echelon were made. These sets would provide the capability and standardization which previously did not exist and would also provide vastly improved service to the field. Additionally, a plan was developed to modernize and replace major components of the secondary transfer set. This set would consist of commercially developed materiel and was to meet increased accuracy requirements for the calibration and repair of electronic, physical-mechanical, RF, microwave, and infrared test, measuring and diagnostic equipment. The TRADOC proponentcy for calibration training was transferred to the US Army Missile and Munitions Center and School. This action should improve coordination and communications with the US Army Metrology and Calibration Center and was expected to bring about an increased awareness of calibration in all training programs. Also, during FY 1977, the number of technical inspections of calibration facilities increased and these would be expanded in the near future to OCONUS installations. This program replaced previous nuclear weapons technical proficiency inspections and was a key element in insuring that a high quality of calibration services was provided to Army activities. Additionally, technical measurement audits of laboratory capabilities were a continuing function. Further efforts were expended on the analysis and fielding of automated calibration systems (ACS) including operational feasibility tests in a mobile environment. Four laboratory automated calibration systems were fielded at internal calibration facilities.

Hardware Improvements-Equipment in Development

(U) The DARCOM RAM program has been structured to insure that realistic and attainable requirements will be developed during early program stages and the RAM engineering effort has been driven by these requirements. It recognized that the only way to achieve reliable and maintainable hardware has been through impact on the design. The RAM engineering effort is initiated during Advanced Development and continues throughout Engineering Development. The tasks include defining RAM requirements in system specifications and allocating resources, incorporating RAM requirements and program efforts in contracts, influencing and evaluating the design demonstrating the achieved RAM values through test. RAM growth management has been formalized within the Army. All of the major Army development programs use RAM growth as a management tool but it has been much more. It has been a design concept that provided the framework against which to conduct the DARCOM RAM effort. The Army objective of delivering systems that have good RAM characteristics was not accomplished simply by conducting a test at the end of the development cycle. That objective was attained by applying engineering and test resources to the RAM program. The RAM mission of providing support to the user is portrayed as resting on three main elements of the program: the requirements, the design, and the test provisions.

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Managing Information Systems

Management Logistics Information

(U) The Commodity Command Standard System (CCSS) is an outgrowth of a DARCOM program to develop standard systems, operating on standard equipment, with standard computer software for wholesale logistics, depot operations, and arsenal/lab operations. This program has provided the basis for all DARCOM resource and budget management actions in the area of data processing. Within the program, CCSS standardizes the wholesale logistics operations performed by the commodity commands.

(U) The CCSS is one of the largest Automatic Data Processing (ADP) business and accounting systems ever developed. A standard approach toward acquisition of hardware and system design was followed. The first phase related to development of the equipment specification, receipt of hardware manufacturer's proposals, evaluation of these proposals, and finally, selection of the equipment. The second phase involved the preparation of specific specifications, programming, testing, and implementation of the applications that would be installed at the prototype installation. The size and complexity of CCSS required new development techniques, as well as unique and intricate implementation plans. These plans called for the hardcore wholesale logistics functions to be implemented in an initial effort known as "AMC Logistics Program Hardcore Automated (ALPHA)." ALPHA included primary systems in supply management, stock control, procurement, cataloging, financial management and provisioning with required supporting systems in the maintenance area. Conversion and implementation of ALPHA was accomplished in three phases. Follow-on applications will be implemented simultaneously by all user commands. ALPHA plus the follow-on systems constituted the CCSS.

(U) On 26 April 1971, the initial phase of ALPHA became operational at the US Army Aviation Systems Command (AVSCOM), the prototype commodity command, in St. Louis, Missouri. Its final phase became operational on 9 January 1972. Subsequent phasing continued to be installed and expanded to the other DARCOM commodity commands, and was completed with the installation of CCSS at the US Army Tank-Automotive Readiness Command in January 1977.

(U) The DARCOM Logistics System Review Board (LSRB), comprised of command group representatives, DARCOM Functional Directors, and Commanders of major subordinate commands, was established as a policy board for management of changes to the Commodity Command Standard System (CCSS). Analysis of the CCSS change management procedures indicated that system modifications were too frequent and that quality of changes was often adversely influenced by time constraints. The

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LSRB has provided revised guidance which reduced the proliferation of major change to a quarterly release basis; additionally, the LSRB has instituted a review procedure which considers relative priority of design effort, significance of results of change, and demonstrated performance of desired results prior to implementation. Actions of the LSRB are expected to markedly improve the management of system change, and consequently, improve logistics mission performance.

(U) DOD Military Standard Contract Administration Procedures (MILSCAP) continued to be extended to DARCOM major subordinate commands. MILSCAP provides standard procedures for use in exchanging procurement/contract administration information in machine-processable form between purchasing offices and contract administration offices. The information interchange supports procurement, materiel management, and financial accounting system requirements. During FY 1977, procedures for abstracting of contracts and contract modifications for transmission to Defense Contract Administration Service Regions were implemented at DARCOM's larger procuring activities. Additional refinements were also made in procedures governing Shipment/Performance Notification, an important input to the logistics system. Planning was proceeding for implementation of the remaining MILSCAP procedures Contract Payment and Collection Notification.

(U) Continuing assessment of the capability of ADP systems to support DARCOM mission requirements has indicated the need to plan for substantive change in methods. Particular areas of concern have been the increasing demands for computer support, aging of installed equipment, and high potential costs of replacement equipment. Improved ADP technology appeared to offer lower-cost alternatives for sustained ADP support. Additional exploration of the concept of distributed processing, placing minicomputers in the functional work environment, is to be conducted. The objective of this research is to extend the economic life of existing DARCOM systems, while concurrently improving the capability to respond to functional user needs.

(U) Also, during FY 1977 Combined Functional/ADP efforts were expended toward the extension of the Standard DARCOM Installation Supply System (SPEEDEX) scheduled for FY 1978 at TARCOM, MIRCOM, and RIA. This system processes all supply transactions at the installation level, including such functions as requisitioning, stock control, receipts and storage. Subsequent to implementation, action is to be taken to review, coordinate and provide DMIS support to the functional directorates in the extension of ISA beyond the depot environment.

(U) Implementation of the Standard Army Civilian Pay System (STARCIPS) within the DARCOM installations with IBM 360 capability was completed during FY 1977. The Army depots will continue to operate the SPEEDEX Civilian Pay and Leave Accounting System until terminals to IBM 360 sites are installed.

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(U) The Army Standard Civilian Personnel Management Information System (SCIPMIS) was implemented at all DARCOM sites, except depots and ARRADCOM, during the period February 1977 and 30 September 1977. SCIPMIS is to be installed at ARRADCOM in November 1977.

Materiel Acquisition Data Management

(U) The Materiel Acquisition Systems Division (MASD) in the Directorate for Management Information Systems, was established at the end of FY 1976; however, it did not become fully constituted until FY 1977. Plans were finalized during the year to convert the Policy and Concepts Branch of the MASD to become a "Business Applications Branch." This marked the first time that a separate branch was established within the Directorate for Management Information Systems with responsibility for "business" type data processing support to the materiel acquisition functions of DARCOM.

(U) As a beginning to carrying out its functions, the MASD organized a series of working conferences and meetings with representatives from the four DARCOM Research and Development Commands not colocated with a Readiness Command. These sessions marked the beginning of efforts to identify commonality in materiel acquisition data processing requirements within DARCOM as a precursor to development of policies with respect to standardization and other aspects of business data processing support to the Research and Development Commands.

(U) Also, during FY 1977, and after many years of effort, a standard automated Configuration Management System (CMS) became a part of the Commodity Command Standard System (CCSS) and available for use at both research and development and readiness commands. A number of changes required in the CMS have been identified. However, the standard automated system for configuration management was now available for use throughout DARCOM to replace the various independent systems which have been in use until now.

(U) As a result of a complete saturation of the scientific and engineering data processing facilities, which support the Missile Research and Development Command (MIRADCOM), a study group was established to look at total requirements for data processing on the Control Data Corporation 6000 series of computers. After a thorough examination of alternatives, it was recommended that an additional computer be obtained for MIRADCOM and this was accomplished during the year. More important was the fact that this effort resulted in the establishment of a new policy which stated that sufficient capacity on a DARCOM-wide basis needs to be maintained to satisfy prime time requirements of DARCOM scientists and engineers. This was added to the existing policy which stated that sufficient capacity must be maintained to process DARCOM scientific and engineering computing requirements within two shifts.

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Automatic Data Processing Equipment

(U) Increased workload at the Logistic Control Activity (LCA) resulting from MODLOG 77 and the Direct Supply System (DSS) generated a need to replace the IBM 360/50 as the LCA was unable to process the increased transaction volume to the Logistics Intelligence File (LIF) and produce the report requirements as established by DA and DARCOM. On 9 December 1975, a request was forwarded to DA to acquire an IBM 370/158. On 16 August 1976, the request was approved by DA on an interim basis not to exceed 2½ years and the 370 was installed in February 1977. ADP specifications were being developed and would be completed and forwarded to DA on 1 February 1978. The interim system should be replaced by 1 June 1979.

(U) The Foreign Science and Technology Center (FSTC) successfully installed an interim upgrade of their ADP equipment capacity in CY 1977. In CY 1975 the FSTC developed a General Functional System Requirement (GFSR) outlining their ADP equipment requirements for the next five years. The GFSR indicated a requirement for 300 times the capacity of the currently installed IBM 360/40. The GFSR was submitted to the Assistant Chief of Staff for Intelligence (ACSI) in March 1976 and was approved by ACSI and the Defense Intelligence Agency (DIA) in January 1977. The Director of Army Automation approval was granted in June 1977. The interim upgrade consists of an IBM 360/50 and a remote job entry IBM 360/20 terminal connected to a host IBM 360/165 located in the Pentagon.

(U) A CDC 76/121 and CYBER 170/73 were installed at Ballistics Research Laboratory (BRL) in October 1977. This equipment is to replace the BRLESK 192 which had been used by the Laboratory for a number of years. The development of requirements, approval and acquisition of equipment has been in progress for approximately ten years.

(U) Core storage and disk drives for all Depot SPEEDEX equipment were replaced during FY 1977 at a cost savings of \$29 million over the systems life of 60 months. In addition, all of the Depot ADP equipment was purchased at a cost of slightly over \$12 million.

Communication/Electronics

Mission

(U) USACC-DARCOM, a subordinate of 7th Signal Command, Fort Ritchie, Maryland which is, in turn, a subordinate of USACC, Fort Huachuca, Arizona provides DARCOM communications operations and maintenance services under the operational control of DARCOM. Command and

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resources are the purview of USACC. Each USACC-DARCOM unit in the field, located at DARCOM depots, arsenals and proving grounds, is commanded (directed) by an individual who dually serves as C-E officer on the staff of the DARCOM installation.

(U) During FY 1976T and FY 1977, communications improvements were accomplished in the introduction of high-speed fscsimile transceiver capability, reduction of error rates in message preparation, and grade of AUTOVON telephone service standardization accomplishments. Additionally, action was initiated to survey communications and upgrade needs to meet surety requirements. No major communications outages occurred. The retention of a ready communications posture was particularly significant in view of the continuing austerity of funding and personnel resources. Personnel allocations were reduced, as they have been in each preceding year, with no reduction in mission or functional responsibilities.

(U) Studies were prepared in anticipation of further cutbacks whereby options for reduced communications services were established should drastic personnel reductions occur. Several actions were taken to eliminate non-viable offices and consolidate activities. Plans were also prepared, for implementation if required, whereby certain other consolidations could be accomplished with the least impact on communications services. DARCOM plans impacted communications only insofar as CONCISE/AMARC actions reduced or adjusted personnel resources commensurate with DARCOM mission changes. To summarize, the period was one of gradual improvement with continued resources austerity.

Organizational Changes

(U) On 1 July 1977, Colonel Hal Christensen assumed command of USACC-DARCOM and responsibilities as Director, Communications-Electronics, DARCOM vice Colonel Merl M. Moore, retired. On 1 October 1976, the DARCOM C-E elements assigned as HQ ARRCOM and HQ TECOM were functionally transferred in place to USACC-DARCOM and redesignated USACC Office-ARRCOM and USACC Office-TECOM, respectively. On 1 July 1977, the USACC Office-AVSCOM was disestablished with identical support services to be continued to be provided by the USACC Agency-St. Louis. Personnel and functions were transferred in place to the St. Louis agency. On 31 August 1977, the USACC Office-LCA was abolished with responsibility day-to-day operations vested in the USACC Agency-Presidio (under FORCES) and responsibility for C-E advisory services assigned to the USACC Detachment-Sacramento.

(U) Plans were completed to take the following actions on 1 October 1977: (1) reduce the USACC Detachment-Frankford to a skeleton organization in keeping with DARCOM CONCISE plans; (2) activate communications-electronics detachments at Hawthorne, Nevada and at McAlester,

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Oklahoma in keeping with the DARCOM take-over of those installations from the US Navy.

(U) On 1 October 1977, USACC-DARCOM assumed responsibility for nontactical communications-electronics (C-E) support to the United States Army Special Security Group (USASSG) at the following activities/ location: HQ DARCOM; Foreign Science Technology Center, Charlottesville, Virginia; Harry Diamond Laboratories, Adelphi, Maryland; Fort Monmouth, New Jersey; Redstone Arsenal, Alabama; Rock Island Arsenal, Illinois; St. Louis, Missouri; White Sands Missile Range, New Mexico; Aberdeen Proving Ground, Maryland; Picatinny Arsenal, Dover, New Jersey; and TARCOM/TARADCOM, Warren, Michigan.

Major Mission Accomplishments

(U) To meet continuing needs for increased speed in the transmission of information, a program was initiated to install high speed digital common user facsimile machines at 60 locations throughout DARCOM by 1980. During FY 1977, machines were installed at TECOM, MIRCOM, TARCOM, TSARCOM, AVRADCOM, ARRCOM and ECOM. Plans are firm for 16 additional installations early in FY 1978.

(U) Error rates in messages transmitted from DARCOM installations remained at an acceptable level in consideration of standards established by the Defense Communications Agency (DCA). The standards call for less than 5 percent messages rejected for error at the switching centers. During FY 1976T/77, 98.6 of all DARCOM messages met the DCA criteria. An ongoing program to provide better telephone service by improving the callers chances of obtaining an AUTOVON line on the first call-up proceeded on schedule. A standard was established whereby callers would get a 90 percent chance of first-call-through and, within DARCOM, 90 percent of all lines were provided that probability. 100 percent standard service was planned early in FY 1978.

(U) C-E representatives participated in seven DARCOM surety inspections to determine communications readiness and to cause action to be taken to correct deficiencies noted. In two instances, Seneca and Sierra, authority was obtained to apply FLASH precedence via AUTOVON under critical conditions. Use of IMMEDIATE precedence was obtained for the 10 chemical sites.

(U) Planning was completed for adjustment of 10 AUTODIN terminals to meet all transmission requirements including those of the DA and DARCOM Standard Management Information Systems and to insure compatibility with terminals at DARCOM Headquarters, Fort Monmouth, Sacramento, Tobyhanna, New Cumberland, Rock Island, Letterkenny, Aberdeen, and Redstone, all heavy users.

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(U) Planning to provide C-E support to Data Processing Installations (DPI) was given command emphasis. Many DPI's have dedicated circuits to remote terminals and interconnecting circuits to other DPI's, however, no provisions exist for isolating technical trouble to specific equipments and/or circuits. Consequently, it was not uncommon to incur extended outages which have a costly and adverse impact on user requirements. Accordingly, planning was implemented to provide, wherever required, USACC-DARCOM operating elements with a Teleprocessing Diagnostic Facility (TDF). The facility would provide the capability to quickly detect and isolate technical troubles through the use of patchable test equipment so the immediate corrective action can be taken. Telecommunications Requirements (TELERS) for 19 TDF's have been developed and submitted for approval, and three additional TELERS were under development. By the end of FY 1977, nine TELERS had been approved and funded by USACC.

Equal Employment Opportunity

Introduction

(U) During FY 1977, the DARCOM Equal Employment Opportunity (EEO) Office continued to implement the requirements of the Equal Employment Act of 1972 to provide equal employment opportunity in Federal employment without discrimination because of race, color, religion, sex, national origin or age. A DARCOM EEO Conference, attended by EEO Officers, Federal Women's Program Coordinators (FWPC) and Spanish Speaking Program Coordinators (SSPC) as well as representatives of Headquarters Department of the Army, US Army Training and Doctrine Command and US Army Forces Command, was held in St. Louis, Missouri, 26-30 September 1977. General J. R. Guthrie opened the session with the keynote address. Conference attendees participated in general sessions and in numerous diversified training and problem solving situations. This occasion marked the first DARCOM EEO Officials' Conference since 1973.

(U) In FY 1977, 231 formal complaints of discrimination were filed throughout the command. The bases for the alleged discrimination are shown on Chart 3.

(U) A total of 218 formal complaints were closed in FY 1977 with a finding of discrimination in 25 or 11.5 percent of the cases. On 18 April 1977 a new class complaint procedure was instituted which replaced the procedures for reviewing third party allegations of discrimination. The first class action complaint in the Department of the Army (DA) was filed at Frankford Arsenal. There were eight class complaints filed during the year.

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EQUAL EMPLOYMENT OPPORTUNITY COMPLAINTS
1 October 1977 - 30 September 1977

| | No. <u>Filed</u> | <u>NO, CLOSED</u> | |
|---------------------------------------|---------------------|------------------------------|-----------------------|
| | | <u>No Discrimination</u> | <u>Discrimination</u> |
| Race/Color | 125 | 87 | 9 |
| Religion | 6 | 6 | 0 |
| Age | 20 | 18 | 3 |
| Sex | | | |
| Female | 24 | 36 | 5 |
| Male | 13 | 9 | 1 |
| National Origin | 28 | 29 | 7 |
| Other (Reprisal, harassment, etc.) | <u>15</u> | <u>8</u> | <u>0</u> |
| TOTAL | 231 | <u>193</u> | <u>25</u> |
| | | 218 | |

Chart 3

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(U) As shown on Chart 4 , the total work force continued on a downward trend from 30 June 1975 to 30 September 1977. There was a decrease in the lower grades (GS/WG 05-09) of 5,402, the middle grades (GS/WG 10-12) of 2,536 and the high grades of 815. The supergrades remained stable from FY 1975. In spite of the decline in the total work force, there have been slight gains for minority and female employees in the middle and high grades.

Spanish Speaking Program

(U) During FY 1977, the Command Spanish Speaking Program Coordinator (SSPC) concentrated his efforts in the areas of program evaluation through field visits and program guidance and direction to coordinators. The Command SSPC visited various DARCOM installations with a predominant number of Hispanics in their work force. The Command SSPC tried to direct their efforts toward bringing awareness to young Hispanics of opportunities of employment with the Army in the various career programs. Although the DA has 19 various career programs, only a handful of Hispanics appear in the Civilian Personnel Administration, Comptroller, Engineer and Supply Career Programs. None or hardly any appear in Intelligence, Public Information, Writing-Editing, Contract and Procurement, Investigator, or Transportation. Meetings were held with Employee Development officers to discuss training being conducted and the overall efforts in career counseling for Hispanics.

(U) Another area of consideration was the Upward Mobility Program (UMP). Unfortunately, due to reductions-in-force (RIF), the UMP in many DARCOM installations had not produced the desired results because UM positions were usually filled by a repromotion eligible or a Priority Placement registrant.

(U) During the period June 1975 to September 1977, DARCOM lost 975 Hispanics primarily because of reorganizations and changes in workload and missions and functions which required the application of RIF procedures in such places as Pueblo, Colorado; Rocky Mountain Arsenal; US Army Dugway Proving Ground; Sacramento and Sharpe Army Depots and others. However, in spite of the downward trend, in class act positions the number of Hispanics increased in grades GS-5 through GS-15 during the second and third quarter FY 1977. In grades GS-5 through GS-9, Hispanics increased in numbers by 50 (3.5 percent); in grades GS-10-12, by 27 (1.9 percent) and in grades GS-13-15 by 23 (1.1 percent).

(U) The Command SSPC has been and continues to be involved in serving as a resource person with the DARCOM Field Placement Office, Atlanta. In this regard, trips to universities with significant numbers of Hispanic students have already been scheduled for FY 1978.

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PROGRAM STATISTICS

| | 30 June 1975 | | | 30 September 1977 | | |
|---|--------------|-----------------|---------------|-------------------|-----------------|---------------|
| | <u>Total</u> | <u>Minority</u> | <u>Female</u> | <u>Total</u> | <u>Minority</u> | <u>Female</u> |
| Lower Grades (GS/WG 05-09) | 48,959(100%) | 9,788(20%) | 14,077(28.8%) | 43,557(100%) | 8,577(19.7%) | 13,434(30.8%) |
| Middle Grades (GS/WG 10-12) | 34,924(100%) | 3,616(10.4%) | 2,206(6.3%) | 32,388(100%) | 3,543(10.9%) | 2,384(7.4%) |
| High Grades (GS 13-15 and WG 13-19) | 12,421(100%) | 570(4.6%) | 234(1.9%) | 11,606(100%) | 601(5.2%) | 252(2.2%) |
| Supergrades (GS 16-18) | 55(100%) | 2(3.6%) | 0(0) | 55(100%) | 2(3.6%) | 0(0) |

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Chart 4

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The Command SSPC was also involved in the development of an EEO Recruitment brochure for the DARCOM Intern Program which will professionalize the efforts of the SSPC's in recruiting activities.

Federal Women's Program

(U) Within DARCOM there has been advancement for women in the General Schedule mid-level positions and upper grades. The number of women engineers increased slightly in the GS-9 to 14 category. Increases occurred in the number of women enrolled in the Apprentice Program and in the wage system positions. This has been directly due to the increased interest and economic need of women, as well as numerous shop conducted tours for women in the work force and the increased publicity regarding "blue collar" job opportunities and encouragement to women to compete.

(U) In the past year, the Command Federal Women's Program Coordinator (FWPC) served on the DA Task Force and provided comments and recommendations to revise FWPC Guidelines, CPR 700, 713E, Appendix E, for incorporation into the Army EEO regulations. The coordinator met with the Assistant Secretary of the Army Advisory Council to participate in program development, to analyze problems and to propose corrective action for effective FWP administration within DA. The Command FWPC also participated on the Department of Defense (DOD) FWP Council as a workshop leader to develop content for a proposed DOD Handbook for FWPC's. Hopefully, these efforts would improve program efforts throughout DA and DOD.

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Chapter II

RESOURCES MANAGEMENT

Manpower and Force Management

Introduction

(U) Force Development Division, Directorate for Personnel, Training and Force Development, pursued an aggressive military and civilian manpower program for DARCOM during FY 1977. This was accomplished through the development and supervision of manpower planning, programming, and budgeting; and the execution of DARCOM staffing policies and manpower requirements and authorizations throughout the Command.

(U) Highlights of some major activities of the Force Development Division include the development of all FY 1977 manpower programs under the supplemental Zero Base Budget (ZBB) for the first time, and submission of the FY 1978-1979 Command Operating Budget Estimate (COBE) and five-year Program Analysis and Resource Review (PARR) to DA and the development, staffing, and publication of Change 3 to the US Army Depot Staffing Guide covering the Directorates for Maintenance and Special Weapons. Also undertaken were the scheduling of twenty manpower surveys for approximately 28,000 spaces and accomplishing eighteen of these surveys for approximately 25,000 spaces during FY 1977. The Division conducted numerous special surveys/studies in diverse areas, such as Family Housing, Army Mobilization Planning (RAMP), and a special survey of the USA Security Agency Materiel Support Command and the US Army Garrison, Vint Hill Farms. It established new procedural relationship between HQ DARCOM and HQ Depot Systems Command (DESCOM) concerning the evaluation of depot manpower requirements and operated the Army Authorization Documents System (TAADS) as a system that looked to the future and provided a management document for DA/DARCOM to use in planning/programming projected workforce to accomplish the workload. Further, this office reevaluated and updated FY 1977/78 TDA/MTOE and Troop Lists, resulting from FY 1977 Civilian Employment Projection (CEP) and FY 1977/78 high grade/average grade adjustments; and monitored and controlled high grade/average grade ceilings and reduction of senior level civilian positions and military grades, through TDA documents, new policy guidance, and special attention to the use of deputy and assistant chiefs, extensive fragmentation, and layering of organization.

(U) The Division dealt with other activities such as the identification of male/female interchangeable positions in TAADS documents, to provide personnel managers with flexibility in making assignments

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and to provide military women with the widest possible range of career and assignment responsibilities. This unit implemented AMARC actions resulting in the reorganization of Tank-Automotive Command (TACOM) into the Tank-Automotive Materiel Readiness Command and the Tank-Automotive Research and Development Command, the establishment of numerous new commands (MIRCOM, MIRADCOM, ARRCOM, ARRADCOM, AVRADCOM, and TSARCOM), and plans for the reorganization of ECOM and HDL into three commands (CERCOM, CORADCOM, and ERADCOM) during FY 1978. Continuing progress was made in the development of unique ADP applications for the purpose of providing management requested data from the Force Accounting System (FAS) and The Army Authorization Documents System (TAADS).

(U) Other examples of force management activities performed were the DARCOM participation in the DA on-going action to develop the Vertical Force Development Management Information System (VFDNIS) which, when completed, will encompass and replace the FAS, TAADS, ITAADS, and other related Force Development Systems; and the continued evaluation of the new Depot System Command (DESCOM), in terms of minimal strength, manpower resources, and timeliness/accuracy of workload and budget guidance to depots. The DARCOM Command Code Structure was converted to permit ease in identifying units within functional groups closely related to command restructuring under AMARC's three groupings - Readiness, Research and Development, and Command Management.

Manpower Program Development

(U) The development of the manpower program was an integral part of the DARCOM Program and Budget System. It provided objectives, policies, and procedures for the management of civilian and military manpower by appropriation and program to accomplish missions assigned. The overall program was based on the DA Program and Budget Guidance (PBG), and on the Five Year Defense Plan (FY DP). All Manpower Programs in FY 1977 were developed under the Traditional Budget Concept and for the first time under the Supplemental Zero Base Budget (ZBB) Concept. The ZBB provided the base for field agencies in the development of manpower requirements in the budget process. A variety of manpower management techniques were used in developing these requirements including ZBB concepts (minimum, current and enhanced levels) to establish several levels of performance.

(U) The Program Analysis and Resource Review (PARR) for the five year period - FY 1979 thru FY 1983 was developed and submitted to DA in February 1977. Included were Civilian and Military Manpower requirements.¹ Also developed and submitted to DA in July 1977 was the Command Operating Budget Estimate (COBE) for FY 1978 and FY 1979 in which civilian manpower requirements were included. It was based upon the

¹DARCOM PARR Manpower Summary, Feb 77.

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DA PBG dated May 1977.² The RDTE Budget Estimate FY 1979 was developed and submitted to DA in September 1977, and included the civilian and military manpower requirements for FY 1979.³

US Army Depot Staffing Guide

(U) Responsibility for developing and maintaining the Staffing Guide for US Army Depots was assigned to Headquarters DARCOM by AR 570-4, "Manpower Management." Under current DA policy, the staffing guide must be revised every three years. This responsibility was delegated to the Utilization, Standards and Policy Branch (DRCPT-SU) of the Directorate for Personnel, Training and Force Development by DARCOM Regulation 10-2, HQ DARCOM, Organization, Mission, and Function Manual. Change 3 to the Depot Staffing Guide was developed by Headquarters DARCOM (DRCPT-SU) and was promulgated by HQDA on 15 September 1977.⁴ This change updated the following portions of the staffing guide: (1) Chapter 1 - Nature, Purpose, and Use of Staffing Guide; (2) Section VI - Directorate for Maintenance; (3) Section VIII - Directorate for Special Weapons. Change 4, a revised Directorate for Management Information System section, had been staffed through HQDA and was scheduled for publication during 1st Quarter FY 1978. In addition, revisions for the following directorates were being developed in HQ DARCOM by Administration, Supply, Comptroller, Services, and Quality Assurance. Extensive close coordination of the in-process revision was maintained with appropriate functional offices in Headquarters DARCOM. In addition, field trips were made to several activities to observe operations and to collect and discuss data for revisions of organizational structure, mission statements, work performed, yardsticks, and staffing tables.

(U) An unusual factor involved in revision of the Directorate for Services section was a requirement, based upon a HQDA request, to evaluate an Office, Chief of Engineers (OCE) proposed Facilities Engineer manpower prediction equation developed for the Garrison Staffing Guide. In response to the request, an on-site evaluation of the application of the OCE Facilities Engineer manpower prediction equation was made during the 6 June - 1 July 1977 manpower survey of Tooele Army Depot (TEAD) by representatives of HQDA (DAPE and DAEN) and HQ DARCOM. Based upon the evaluation at TEAD, and in furtherance of the HQDA goal of standardization of staffing guidance, the revision of Directorate for Services section of the Depot Staffing Guide being prepared for submission to HQDA will direct the use of the Facilities

²COBE, Commander's Statement FY 1978 and FY 1979, July 1977.

³RDTE Budget Estimates FY 1979, September 1977.

⁴Change No. 3, DA PAM 570-566, Staffing Guide for US Army Depots, 15 Sep 76.

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Engineer section of the Garrison Staffing Guide, which was based upon the aforementioned equation, for determining Facilities Engineer manpower requirements at DARCOM depots.⁵

Manpower Survey Program

(U) The Manpower Survey Branch of the Manpower Support Division, US Army Personnel Support Activity, was assigned the mission of conducting manpower surveys, normally on a two year cycle, of all activities reporting to Headquarters DARCOM. Also, it monitored 10 percent of the manpower surveys conducted by the major subordinate commands; and reviewed all completed surveys conducted by the major subordinate commands.⁶

(U) To accomplish its mission, the Manpower Survey Branch scheduled 20 surveys covering approximately 28,000 spaces⁷ and three monitors of major subordinate command surveys during FY 1977. Eighteen manpower surveys covering approximately 25,000 spaces were actually surveyed. A shortfall in the Headquarters, DARCOM manpower survey program occurred due to requests by commanders to cancel surveys mainly because of organization realignments. Survey team validated space requirements through the 3rd Quarter resulted in a decrease of three military spaces and increase of 417 civilian spaces for a net increase of 414 spaces. This reflected a situation where manpower allocations were not commensurate with assigned workload. The three surveys scheduled for monitor by this headquarters were cancelled by the respective SUBMACOMS due to internal management studies and reorganization actions. Thirteen surveys conducted by the major subordinate commands in FY 1976 and FY 1977 were reviewed by the Manpower Survey Branch and forwarded to DA after ascertaining that they met Headquarters DARCOM survey standards.

(U) Establishment of a new Headquarters DESCOM necessitated development of a new relationship between Headquarters DARCOM and Headquarters DESCOM with respect to evaluation of personnel requirements for the depots and depot activities.⁸ This involved another layer in the chain of command regarding depot survey approvals.

⁵Ltr, DRCPT-SU, Subj: Revision of Section IV, Directorate for Services, DA PAM 570-566, Staffing Guide for US Army Depots, dtd 11 Jul 77.

⁶AR 570-4, 17 Nov 75, Manpower Management (Section II; DARCOM Reg 10-51, Organization & Functions - DARCOM PSA (Para 3c(1))).

⁷DA Form 1845, Schedule of Manpower Surveys (20 Aug 76).

⁸Procedural Relationship - DARCOM PT&FD Dir - DESCOM.

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Special Surveys/Studies

(U) Manpower Survey Branch personnel assignments included participation as a coordinator for the DAIG survey of HQ DARCOM and PSA (16 August-17 December 1976). To evaluate actions in the field and improve management of housing activities, at the direction of the DARCOM Chief of Staff, this Branch conducted on 11-15 October 1976 a family housing inspection at Redstone Arsenal, Alabama.

(U) Also, a special functional survey of review of Army Mobilization Planning (RAMP) was carried out. Chief of Staff, DARCOM tasked all field elements to provide input data to justify their Industrial Preparedness Program (IPP) manpower requirements. The majority of data received was not adequate to justify manpower resources requested; therefore, on-site evaluations were required. Survey analysts performed on-site evaluations at various depots and MSC's to validate requested manpower spaces.

(U) A special study that took place within Maintenance Directorate, TARCOC, during the period 29 November - 2 December 1976 was in response to a request from the Headquarters DARCOM Publications Branch.⁹ This represented a SUBMACOM feeling of confidence in the survey team to recommend minimal mission essential staffing.

(U) A special survey was conducted at USASA Materiel Support Command and US Army Garrison, Vint Hill Farms, Virginia, to establish a viable base for subsequent adjustment of manpower resources between INSCOM and DARCOM. These survey reports were since used in redistribution of manpower spaces between DARCOM and INSCOM for the establishment of ERADCOM (Provisional), and in the delineation of "acquisition" and "readiness" functional responsibilities.

The Army Authorization Documents System (TAADS)

(U) The Army Authorization Documents System produced Tables of Distribution and Allowances (TDA), Modification Tables of Organization and Equipment (MTOE), and Mobilization Tables of Distribution and Allowances (MOB TDA). TAADS provided a management document for DA/DARCOM to use in planning/programming projected workforce to accomplish workload. As such, these documents reflected the unit mission, organization structure and requirements/authorizations for manpower and equipment. The manpower section included requirements and authorizations for permanent and temporary personnel. TAADS documents were produced within a sequence of Army Troop Program actions.

⁹ Memo for Chief, Force Dev Div, 6 Dec 76, Subj: Trip Report - TARCOC - Re Spaces for Improved Technical Documentation & Training (ITDT).

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The sequence included issuance of Program Budget Guidance (PBG)/change; unit preparation and submission of troop list, in accordance with PBG/change; and preparation of TDA/MTOE based on the troop list. Also, the sequence served to identify PBG/change pertaining to manpower to unit level in the troop list and then define these manpower authorizations by job title, grade, skill and Army Management Structure Code (AMSC) in the unit TDA/MTOE. The Force Accounting Structure (FAS)/TAADS cycle for producing command plans and matching TDA/MTOE included three fiscal years--current, budget and 1st program. To meet minimum requirements, TAADS expected an initial TDA/MTOE and an update MOB TDA for each of the fiscal years. Experience gained from TAADS processing since 1973 reflected an average of 5 to 5½ TDA/MTOE/MOB TDA for each DARCOM unit during each fiscal year to maintain unit authorizations current in addition an average of three Consolidated Change Documents (CCD) were published for each unit for each fiscal year. The CCD contained administrative type changes for the most part, reducing the need to publish a new TDA/MTOE/MOB TDA. Strength changes generally required publication of a new document. Contrary to the TAADS that existed prior to August 1973, in FY 1977 TAADS was a system that looked into the future, not the past. Documents contained in the TAADS file had to have a status of current, projected proposed or projected approved.

Submission of FY 1977/78 TDA/MTOE and Troop Lists

(U) As a result of the Civilian Employment Projection (CEP) adjustments and the high grade/average grade adjustments, it was necessary to reevaluate and update FY 1977/78 TDA/MTOE and troop lists in accordance with these adjustments.¹⁰ This requirement caused all previously submitted FY 1978 negative submissions to be cancelled by DARCOM. FY 1978 TDA/MTOE had to be revalidated to comply with the new guidance. Also, it was necessary to revise DARCOM Troop Lists to accommodate the identification of GS-13 positions and above. The revised form provided a recap of permanent civilian positions by GS-13 and above, GS-12 and below, and other permanent positions.¹¹ DARCOM Commanders indicated that they were unable to take action necessary for submission of documents within the time frame established by HQ DARCOM for submission of 1977/78 TDA/MTOE and therefore, they were relieved from the requirement to reflect the civilian grades in the FY 1977 document.¹² TDA/MTOE for FY 1978 were due to reach DA 30 September 1976, but as of 22 August 1977, only 49 of the 225 had been

¹⁰DRCPT-CP ltr, 17 Mar 77, Subj: Reduction of Senior Level Civilian Positions.

¹¹DRCPT-S ltr, 25 Mar 77, Subj: Submission of FY 77/78 TDA/MTOE and Troop Lists.

¹²DRXMM-TM msg DTG 151818Z Sep 77, Subj: TAADS Document Submissions.

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submitted for FY 1978. All FY 1979 TDA/MTOE were due to reach DA not later than 30 September 1977; however, as of 30 September 1977, DA has not received any FY 1979 TDA/MTOE documents.

Control and Reduction of High Grades

(U) In keeping in line with the President's initiative and Secretary of Defense's direction, the Department of the Army established high/average grade ceilings for DARCOM which were allocated to DARCOM sub-MACOM's/Activities. It was DARCOM's decision to monitor and control high grade/average grade through the use of FY 1977/FY 1978 TDA documents. Therefore, TAADS documents had to be submitted in keeping with the high/average grade control. Entering this information into TAADS program late in FY 1977 tended to delay receipt and processing of the initial FY 1978 documents in a timely manner. FY 1978/FY 1979 TDA's were, and will continue to be, closely monitored to assure compliance with high grade and average grade ceilings. The new policy guidance announced on 27 July 1976 by the Deputy Director, Personnel, Training and Force Development, covering deputy and assistant positions, greatly reduced excessive layering in DARCOM units.¹³ Prior to announcement of the new policy, positions qualifying for deputy and assistant chief had to meet only two criteria. Under the new policy, positions qualifying must meet three out of five of the established criteria. The new criteria was applied during the review of TDA documents which implemented the reorganization of DARCOM as a result of the Army Materiel Acquisition Review Committee (AMARC) study. This new policy was to be included in revised DARCOM Regulation 570-4, Manpower Support, Staffing Standards, Patterns and Policies, currently under revision.

(U) On 20 October 1976, the Vice Chief of Staff, Army, announced requirements for the reduction of senior level civilian positions and military grades.¹⁴ In order to assure that the Commanding General DARCOM would obtain objectives of this reduction, he recommended use of reducing supervisor-employee ratio, and elimination of unnecessary organizational layering. Further, he required stringent controls on upgrading actions by ensuring that new positions were essential and correctly evaluated. Headquarters, DARCOM's implementation of Vice Chief of Staff direction was accomplished during the review of update FY TDA's and included special attention in the use of deputy and assistant chiefs, extensive fragmentation and layering of organization.

¹³ Criteria for Deputy and Assistant Positions, dtd 27 Jul 77.

¹⁴ Chief of Staff, Army, ltr, 20 Oct 76, Subj: Reduction of Senior Level Civilian Positions.

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Male/Female Interchangeable Positions

(U) In order to provide military women with the widest possible range of career and assignment responsibilities, and provide personnel managers at all levels with flexibility in their assignment, DA directed that all positions meeting the interchangeable criteria be so identified in the TAADS document. DA had two basic requirements for "male only" positions--Combined Arms (Infantry, Armor and Artillery) and restricted aviator positions, and that these positions be documented accordingly in TDA's.¹⁵ As of 30 September 1977, DARCOM TDA documents reflected fewer "male only" positions than any other previous reporting period.¹⁶

AMARC Implementation Actions

(U) DARCOM AMARC Implementation Plan resulted in implementation for one command during FY 1977 and plans for completion for all other commands during FY 1977 and FY 1978.

(U) Tank-Automotive Command (TACOM) was reorganized into Tank-Automotive Materiel Readiness Command, and Tank-Automotive Research and Development Command, effective 1 July 1976.

(U) Missile Command (MICOM) was reorganized into Missile Materiel Readiness Command (MIRCOM) and Missile Research and Development Command (MIRADCOM), effective 31 January 1977.

(U) Armaments Command (ARMCOM) was reorganized into Armament Materiel Readiness Command (ARRCOM), and Armament Research & Development Command (ARRADCOM), effective 31 January 1977.

(U) Aviation Systems Command (AVSCOM) and Troop Support Command (TROSCOM) were reorganized into Aviation Research and Development Command (AVRADCOM), and Troop Support & Aviation Materiel Readiness Command (TSARCOM), effective 1 July 1977.

(U) The Secretary of the Army approved the reorganization of Electronics Command (ECOM) and Harry Diamond Laboratories (HDL) into three commands as announced by a press release, 13 July 1977, with reorganization tentatively earmarked for second quarter, FY 1978. Upon final approval of the ECOM/HDL reorganization, all AMARC actions will be complete.¹⁷

¹⁵Ltr, DAMO-FDU, 21 May 76, Subj: TAADS System Changes and Functional Guidance

¹⁶Interchangeability Report as of 30 Sep 77.

¹⁷AMARC Implementation Status, 1 Sep 77.

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ADP Applications

(U) Progress continued in the program to develop unique automated applications for the purpose of providing management requested data from the Force Accounting System and the Army Authorization Documents System. The programs were developed and useable to the extent of data available in the system. Effort was in process to add additional data elements to the system which will generate the need to develop the final group of programs required to respond to management requests. Management response to the service was most favorable in terms of appreciative remarks and statements of man-hours saved.

Vertical Force Development Management Information System (VFDMIS)

(U) Headquarters DA had an on-going action to develop the Vertical Force Development Management Information System (VFDMIS). The system, when completed, will encompass and replace the Force Accounting System (FAS), The Army Authorization Documents System (TAADS), Installation The Army Authorization Documents System (ITAADS) and other related Force Development Systems. The system will probably become available during calendar year 1980. DARCOM participated by written input and formal and informal discussions.

Installation, The Army Authorization Documents System (ITAADS)

(U) During the year, Headquarters DA adopted and published a directive/plan for implementing Installation, The Army Authorization Documents System (ITAADS) Army-wide. Implementation was initiated in DARCOM in June 1977 at Fort Monmouth, NJ and was to continue under a schedule that extended through June 1978. Availability of ITAADS will provide DARCOM units with current knowledge of the approved manpower and equipment authorization base, and provide automated support that will respond to need for simultaneous development of multiple TDA/MTOE for a single unit. Further, it provided edits at unit level that will improve data accuracy, and expedite transmission of data between unit/sub-MACOM, DARCOM and DA.

(U) ITAADS was designed to accommodate only a vertical flow of data. This design accommodated a command structure of installation, MACOM and DA as was common in Training and Doctrine Command (TRADOC) and Forces Command (FORSCOM). It did not accommodate the DARCOM Command structure of unit, sub-MACOM, MACOM and DA because there was no capability to flow data from units located at stations away from their parent sub-MACOM through the sub-MACOM for command action. Unique DARCOM programs were being developed and a Systems Change Request had been forwarded to Headquarters, Computer Systems Command (USACSC) to alleviate this condition.

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Establishment of US Army Depot System Command (DESCOM)

(U) On 27 August 1976, the Secretary of the Army announced the establishment of the US Army Depot System Command (DESCOM), a major subordinate element of DARCOM located at US Army Depot, Letterkenny, effective 1 September 1976.¹⁸ DESCOM was established as a result of the reorganization of DARCOM and was designed to optimize the effectiveness of depot operations and enhance the Army's readiness posture. The DESCOM mission encompassed that formerly assigned to US Army Major Item Data Agency (MIDA) in addition to the command and control of the depots and depot activities in accomplishment of their mission relative to receipt, storage, issue, maintenance and base operations. DESCOM was established with a strength of 581 civilian and 32 military spaces, an increase of 28 civilian and 13 military spaces. The insignificant increase in spaces resulted from Congressional mandate, in approval of the reorganization, that there would be only a minimal strength increase. Further, all manpower resources would be provided from within DARCOM resources. In order to live within the manpower authorized, DESCOM could not perform all the functions ordinarily associated with a subordinate major command and therefore was satellite on US Army Depot Letterkenny for transportation, logistics and equipment support. It was expected that DESCOM will improve timeliness and accuracy of workload and budget guidance to depots and provide a balance between supply and maintenance workloads. Inasmuch as DESCOM had been in existence for a period of only one year, total evaluation remained to be determined.

Revised Major Command Code Structure

(U) Reorganization under AMARC made it impractical to control units under the new structure with only nine Command Codes (M1 thru M9) available to DARCOM. For this reason, a request was submitted on 23 September 1975 to Headquarters DA to revise the Command Code Structure. It was approved on 31 March 1976.¹⁹ However, implementation of the change was delayed until 24 March 1977, in order to allow sufficient time for a systems change package to be developed for Army-wide standard systems like VTAADS, SIDPERS and CIVPERS. Conversion of the DARCOM Command Code Structure from "M" to "X" was completed on 24 March 1977, with the exception of "M7" TECOM, which was delayed until 15 July 1977, in order to maintain compatibility

¹⁸(1) DA Message, DACS-DMA, DTG 311105Z Aug 76, Subj: Activation of US Army Depot System Command (USADESCOM). (2) DARCOM msg, DRCIN-PI DTG 271932Z Aug 76, Subj: Establishment of the US Army Depot System Command (DESCOM).

¹⁹(1) Ltr, AMCPT-S, HQ DARCOM, 23 Sep 75, Subj: Request for Revised Major Command Code. (2) Ltr, DAMO-FDP, HQ DA, 31 Mar 76, Subj: Request for Revised Major Command Code.

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between VTAADS and SIDPERS.²⁰ The revised Command codes permitted ease in identifying units within functional groups closely related to command restructuring under AMARC's three groupings--Readiness, Research and Development, and Command Management.

Transfer of Maintenance Plants from Europe to DARCOM

(U) As a result of the Modernization of Logistics 1977 (MODLOG 77) directed actions, command and control of the two maintenance plants in Europe were reassigned on 1 July 1976 from US Army Europe to DARCOM, and further reassigned on 30 September 1976 to DESCOM. Effective 1 October 1977, the two plants were redesignated as US Army Depot Mainz (MZAD) and US Army Depot Activity Ober-Ramstadt (ORDA).²¹

Unit Adjustments and Documents Processed

(U) At the end of FY 1977, DARCOM had a total of 250 TDA/MTOE units. Of these, there were nine TDA units pending discontinuance during FY 1978 leaving 241 active TDA/MTOE units within DARCOM. During the past 15 months (FY 7T and FY 77), 47 new units were established, 38 units were discontinued, 47 units redesignated and 170 units reassigned, for a total of 302 unit adjustments. In addition, five DARCOM sub-MACOM's were reorganized into eight new sub-MACOM's and two laboratories reorganized into two sub-MACOM's for a total of 10 new DARCOM sub-MACOM's.

(U) A total of 2027 TAADS actions were processed during FY 1977. These actions included TDA/MTOE document submissions and changes from Headquarters DARCOM sub-MACOM's and field units, actions initiated by Headquarters DARCOM and MOS/LIN edit actions to the master file. In addition, 1092 DA approved/acknowledged TAADS/MTOE documents were processed during FY 1977.

Management of Change (MOC) Study

(U) The purpose of the Management of Change (MOC) Study Group was to determine the frequency, magnitude and types of changes documented in The Army Authorization Documents System (TAADS) and to develop procedures to reduce the amount of changes requiring field

²⁰ Ltrs, DRCPT-S, HQ DARCOM, 24 and 25 Mar 77, Subj: Revised Major Command Code Structure.

²¹ (1) DA General Order No. 18, 30 Sep 76; (2) DARCOM Permanent Order 28-2, 15 Oct 76; (3) DARCOM Permanent Order 71-1, 7 Sep 77.

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response. As a result of the study, the Chief of Staff, Army, on 26 August 1977, approved for implementation the MOC Study. It constrained the update of unit authorization documents to a semiannual cycle except for HQDA approved, and emergency/urgent updates which had to be accomplished out-of-cycle to preclude unacceptable degradation of near-term unit readiness. The promulgation of authorization change guidance and the production of outputs which used the TAADS file as an input will all be scheduled and sequenced to accommodate the semiannual updates and the information needs of the TAADS data users. Implementation will be through change to AR 310-49 regulation which was scheduled for publication late November 1977, with implementation date of 1 April 1978.²²

TAADS Documentation of Organizational Effectiveness Offices

(U) In May 1977, HQDA provided the authority to document Organizational Effectiveness (OE) Offices and Organizational Effectiveness Staff Officer (OESO) positions in the TAADS documents of the MACOM's. HQDA authority had been provided in March of 1977 to establish the OE positions by redistribution of current allocated manpower resources.²³ It fell within the mission of the Manpower TDA Branch to insure that the OE offices and OE positions were documented in the TAADS documents of Headquarters, DARCOM and DARCOM sub-MACOM's. The Manpower TDA Branch therefore provided input to the Headquarters, DARCOM OE Office on the OE Implementation Plan submitted to HQDA. Follow-on action was accomplished by the Manpower TDA Branch and OE offices and positions were reflected in the TAADS documents of HQ DARCOM and DARCOM sub-MACOM's. In accordance with HQDA guidance, the positions to staff the new OE offices were provided by redistribution of current allocated spaces.

Force Accounting and Allocation

Fiscal Year 1977 Civilian and Military Personnel Changes

(U) In FY 1977 DARCOM was reduced by a net of 7,118 in Civilian Employment Projection and increased by a net of 456 military authorized spaces. Actual civilian strength dropped from 109,410 at end FY 197T

²²Chief of Staff Memorandum 77-5-41, 26 Aug 77, Subj: Implementation of the Management of Change (MOC) Study Recommendations.

²³(1) DA msg DAPE-HRL-O, 021815Z Mar 77, Subj: Organizational Effectiveness (OE) Structure and Authorization. (2) DA msg DAMO-FDP-O, Subj: Organizational Effectiveness (OE) Structure and Authorization.

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to 104,544 (102,149 full-time permanent and 2,395 temporary part-time employees) at end FY 1977. Actual military strength was reduced from 9,012 at end FY 1976 to 8,833 at end FY 1977, a reduction of 179 (-126 Officers; -5 Warrant Officers; -48 Enlisted).

DARCOM Officer Projected Requisitioning Authority (PRA)

(U) The PRA provided for the first half of FY 1977 permitted 96.5 percent coverage of DARCOM's authorized TD/TOE positions. For the last quarter of FY 1977 the PRA coverage was 95.4 percent. PRA continues to be received from HQ MILPERCEN by grade and Specialty Code on a semi-annual basis. Adequate requisitioning authority was provided throughout the fiscal year.

Command Officer Grade Objective (COGO)

(U) The Command Officer Grade Objective (COGO) is now included as an integral part of the DARCOM Program Budget Guidance (PBG) provided by HQDA. COGO was expressed as a percentile for each grade of the total DARCOM officer authorization. Previously, COGO exempted only General, MC and DC officer authorization. Now, all controlled branches (CH, JA, MC, VC, DC and MS) and General Officers are exempted. The trends in deviation in the COGO from PBG to PBG were becoming minor in nature and were usually adjusted through normal attrition.

HQ DA Study Group

(U) A Headquarters DA Study Group was tasked to determine DARCOM's total military requirement at end CY 1976.²⁴ On 27 October 1976, ODCSOPS, DA increased DARCOM's military authorization by 205 Officer, 27 Warrant Officer, and 48 enlisted spaces (aggregate 280).²⁵ These military spaces were suballocated to commands/activities for priority workload, primarily to Program/Project/Product Managers.

Civilian Manpower Guidance/Ceilings

(U) In FY 1977, DARCOM did not apply any self-imposed hiring freeze on subordinate commands/activities. On 1 March 1977, however, the President ordered a hiring limitation on Federal civilian employment pending the establishment of new employment ceilings for fiscal years 1977 and 1978. The hiring limitation applied to Full-Time Permanent (FTP) direct hire vacancies, which could not be filled by accession

²⁴Chap I, Annual Report of Major Activities, Dir for Personnel, Training and Force Development, FY 1976/1977.

²⁵Ltr, DAMO-FDP, "DARCOM Military Manpower Allocation," 27 Oct 76.

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from outside DOD except under a three out of four formula applied to vacancies occurring after 28 February 1977. DARCOM implemented DA guidance relative to these limitations in March 1977.²⁶

(U) In July 1977, the Presidential hiring limitation was lifted, and DA established a civilian employment ceiling of 105,704 positions upon DARCOM for end FY 1978 without a change in end FY 1978 civilian authorizations of 106,271 spaces. DA specified that reductions would be made through attrition or if required by selectively limiting hiring as needed to reach the reduced level. It was determined that DARCOM could reach this level without imposing specific ceilings and guidance to this effect was issued to subordinate commands/activities. On 30 September 1977 (end FY 1977), DARCOM's actual civilian on-board strength was 104,544; this was 1,160 below the DA limitation, and 1,727 below the DA authorization. The shortfall was primarily due to the AMARC realignment impact at the sub-MACOM's.

Program Budget Guidance (PBG) Automation

(U) In 1974 plans were made to automate the manpower portion of the Program Budget Guidance (PBG) document. Working closely with the Resources Data Analysis Division (located at the Tobyhanna Army Depot, PA), of the USA DARCOM Logistics Systems Support Activity a program was established for computerization of the DARCOM manpower data base. The goal was to document and maintain an automated system whose primary output would produce a biannual (with monthly update) manpower authorization audit trail. The March 1976 Appendix B of the PBG was manually produced and issued; in May 1976 a parallel automated version was also produced on a trial basis. This latter version contained transposition discrepancies and the system had to be debugged. Other trial runs were produced and corrected until in March 1977 a fully acceptable document was produced and issued to field activities. Since then, monthly updates have been provided to all DARCOM commands/activities.

Army Management Headquarters Activities (AMHA)

(U) The military and civilian strength ceilings established by DA in March 1974 for DARCOM's Army Management Headquarters Activities (AMHA) continued through end FY 1977.²⁷ The realignment of DARCOM under AMARC recommendations in effect abolished the commodity commands formerly included by DA/DOD in the AMHA ceiling. Accordingly, in May 1977, DARCOM recommended to DA that the AMHA Army Regulation as well as

²⁶ Msg, DRCPT-SA, "End Year FY 77 Civilian Manpower Employment Level," 021958Z.

²⁷ Ibid

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ADJUSTMENTS IN DARCOM MILITARY AUTHORIZATIONS AND
CIVILIAN EMPLOYMENT PROJECTIONS

| | MILITARY | | | | CIVILIAN EMPLOYMENT PROJECTION | | |
|--------------|-----------------------------|------------|-----------|-----------|--------------------------------|------------|------------|
| | <u>TOTAL</u> | <u>OFF</u> | <u>WO</u> | <u>EM</u> | <u>TOTAL</u> | <u>FTP</u> | <u>TPT</u> |
| | <u>DA PROGRAM TO DARCOM</u> | | | | | | |
| END FY 197T | 9,524 | 2,898 | 211 | 6,415 | 113,389 | 112,507 | 882 |
| END FY 1977 | 9,980 | 3,155 | 241 | 6,584 | 106,271 | 104,528 | 1,743 |
| FY 1977(+/-) | + 456 | + 257 | +30 | + 169 | - 7,118 | - 7,979 | + 861 |
| <hr/> | | | | | | | |
| | <u>DARCOM PROGRAM</u> | | | | | | |
| END FY 197T | 9,451 | 2,897 | 212 | 6,342 | 114,662 | 112,233 | 2,429 |
| END FY 1977 | 9,902 | 3,119 | 238 | 6,545 | 107,410 | 105,478 | 1,932 |
| FY 1977(+/-) | + 451 | + 222 | +26 | + 203 | - 7,252 | -6,755 | - 497 |

NOTE: DARCOM Program for military spaces differed from DA Program due to administrative lead time in implementing/reporting military changes.

DARCOM Program for civilian spaces exceeded DA Program based on DARCOM's over-allocation of spaces in anticipation of hire lag (Authority: paragraphs 4c and e, AR 570-4).

Chart 5

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MAJOR ARMY MATERIEL COMMAND ACTIVITIES
ACTUAL CIVILIAN STRENGTH

| | FY 1976 30 Sept 1976 <u>TOTAL</u> | FY 1977 30 Sept 1977 <u>TOTAL</u> | <u>DIFFERENCE</u> |
|--------------------|---|---|-------------------|
| TOTAL | 109,410 | 104,544 | -4,866 |
| (FTP) | (107,003) | (102,149) | (-4,854) |
| (TPT) | (2,407) | (2,395) | (- 12) |
| HQ DARCOM | 1,248 | 1,205 | - 43 |
| SUB-MACOMS | 57,627 | 54,833 | -2,794 |
| 74 DEPOTS (DESCOM) | 37,753 | 36,564 | -1,189 |
| PROJECT MANAGERS | 1,162 | 1,283 | + 121 |
| RESEARCH LABS | 5,885 | 4,523* | -1,362 |
| ALL OTHER | 5,735 | 6,136 | + 401 |

* Exclude Ballistic Research Lab, which is included in the Sub-MACOM total as part of ARRADCOM for end FY 1977.

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the DOD Directive be amended to delete the commodity commands from the AMHA ceiling listing, leaving only Headquarters DARCOM and the seven DARCOM Staff Support Activities under this controlled program.²⁸

(U) In July 1977, DA advised that the DARCOM proposal was being reviewed by the OSD Management Headquarters Working Group. At the close of FY 1977, no response had been received from DA.

REFLEX

(U) REFLEX was a test program designed to test the concept of using fiscal controls instead of both fiscal controls and manpower controls to manage operations of selected activities. All REFLEX activities were exempted from manpower surveys unless self-initiated and initially REFLEX activities could exceed their civilian authorization where supported by workload and funds. The authority to exceed civilian REFLEX authorizations was suspended on 19 December 1975 due to reductions in civilian manpower and funds. In FY 1977 DA initiated a review and evaluation to determine the future of REFLEX throughout Army. Pending a decision from DA, REFLEX activities continued to operate under a manpower ceiling. On 30 September 1977, in consideration of the continued operation of ceilings on manpower spaces and grades and the revalidation of the DA manpower survey program, DA terminated Project REFLEX.²⁹ All DARCOM commands/activities were so advised.

Civilian Personnel Management

Introduction

(U) While DARCOM's civilian population continued to decline, the number of subordinate commands and the number of general officers increased as AMARC implementation proceeded. The volume of work in the civilian personnel program, therefore, did not increase based on the number of personnel serviced, but rather on the need to be responsive to more commanders. New complexities in the organization triggered a significant upswing in staff assistance visits and surveys of DARCOM field activities during FY 1977. This increase in contact with the field keynoted FY 1977 as being a year in which the entire DARCOM personnel community worked for unified and coherent actions through open lines of communication while recognizing the ongoing need for decentralized decision authorities.

²⁸Ltr, DRCPT-SA, "DARCOM-Army Management Headquarters Activities (AMHA)," 5 May 77.

²⁹Ltr, DAMO-FDP-O, "Project REFLEX," 30 Sep 77.

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PROJECT REFLEX DATA

| | DATE STARTED INIT AUTH <u>1 Jul 70</u> | END FY 1976 30 Jun 76 <u>ACTUAL</u> | END FY 197T 30 Sep 76 <u>ACTUAL</u> | END FY 1977 30 Sep 77 <u>ACTUAL</u> | INITIAL vs <u>END FY 1977</u> |
|---------------|--|---|---|---|-------------------------------------|
| REFLEX (DOD) | 6,111 | 6,004 | 5,903 | 5,604 | - 507 |
| FTP (5,982) | | (5,869) | (5,774) | (5,464) | (- 518) |
| TPT (129) | | (135) | (129) | (140) | (+ 11) |
| REFLEX (ARMY) | 1 Oct 72 | | | | |
| | 5,705 | 5,357 | 5,509 | 4,872 | - 833 |
| FTP (5,705) | | (5,235) | (5,420) | (4,742) | (- 963) |
| TPT (0) | | (122) | (89) | (130) | (+ 130) |
| REFLEX ARMY | 1 Jul 73 | | | | |
| Extended | 10,492 | 10,242 | 4,772* | -** | -10,492 |
| FTP(10,140) | | (9,907) | (4,735) | - | (-10,140) |
| TPT(352) | | (335) | (37) | - | (- 352) |
| REFLEX (RDTE) | 1 Jul 75 | | | | |
| | 14,969 | 15,921 | 15,150 | 17,720 | + 2,751 |
| FTP(14,967) | | (15,443) | (14,745) | (17,252) | (+ 2,285) |
| TPT (2) | | (478) | (405) | (468) | (+ 466) |
| TOTAL REFLEX | 37,277 | 37,524 | 31,334 | 28,196 | -9,081 |
| FTP(36,794) | | (36,454) | (30,674) | (27,458) | (-9,336) |
| TPT(483) | | (1,070) | (660) | (738) | (+ 255) |

* Reduction from end FY 76 to end FY 7T for REFLEX ARMY Extended (from 10,242 to 4,772) due to REFLEX Test Termination at Red River Army Depot, 30 Jun 76.

**Reduction from end FY 7T to end FY 77 for REFLEX ARMY Extended (from 4,772 to 0) due to Picatinny Arsenal being absorbed by ARRADCOM under AMARC; residual spaces are reflected in REFLEX (RDTE) totals.

NOTE: Project REFLEX terminated by DA, 30 Sep 77.

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Employee Management

(U) AMARC Implementation. The realignments brought upon DARCOM as a result of AMARC implementation required the close attention of DARCOM Civilian Personnel Division both in the planning stages and during the actual process of effecting the changes. In addition, the audit capability of the Personnel Support Division was increasingly summoned to track the progress being made in the field. This drain on resources and personnel expertise will shrink as AMARC nears 100 percent implementation.

(U) AMARC Competitive Areas. A modification of the DARCOM policy on competitive areas resulted from the implementation of AMARC. The primary effect of AMARC within this command was to divide the components of the respective commodity commands into Research and Development Commands on the one hand, and Readiness Commands on the other.³⁰ DARCOM policy provided that collocated R&D and Readiness Commands, or elements thereof, may not be placed together in a single competitive area. R&D and Readiness were recognized as separate communities of interest. Their separation into different competitive areas prevented turbulence in one from adversely affecting the employees of the other. This fact resulted in a perception by some employees that there was an adverse impact on them because of the split competitive areas.

(U) CONCISE - Lexington-Blue Grass Army Depot. The original CONCISE plan called for the elimination of the Electronics Maintenance Mission at Lexington-Blue Grass Army Depot and reduction, by 30 June 1976, of the Depot to Depot Activity status. However, because of litigation which included a court injunction, the action was not completed until 24 July 1977. The basis for the injunction had been a claim by third party plaintiffs that the Environmental Impact Statement (EIS) did not meet the requirements of the National Environmental Protection Act (NEPA) of 1974. These plaintiffs claimed the EIS was deficient in socio-economic data. On appellate review the 6th District Court of Appeals ruled that the intent of the legislation had not included socio-economic data and analysis of the degree claimed by the plaintiffs. As a result of that appellate review, the injunction was terminated and the Depot was able to complete the CONCISE actions.

³⁰DRCPT-CRE msg 301624Z Nov 76.

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Standard Civilian Personnel Management Information System (SCIPMIS) I

(U) In June 1976, DARCOM Personnel Management Information System (PMIS) was selected as the baseline for the Department of the Army Decentralized Standard Civilian Personnel Management Information System. As part of the agreement with DCSPER, DARCOM provided two training instructors to support the DCSPER Training Cadre which extended functional training throughout DA.³¹ During April-August 1977, 175 employees were trained of which 47 were DARCOM employees. There were 36 operating Civilian Personnel Offices (CPO) under DARCOM jurisdiction; 17 CPO's were operational on the DA SCIPMIS I version;³² 15 were operational on SCIPMIS I (D) (DARCOM version). Frankford and Rocky Mountain Arsenal were exempt as result of AMARC implementation which dissolved these two CPO's. Army Research Center was exempt because of size and cost factors, and ARRADCOM was to be operational on 14 November 1977.³³

Incentive Awards

(U) The DARCOM Incentive Awards Review Board considers nominations for high level honorary awards requiring action by the CG DARCOM, DA, DOD or higher levels. During Fiscal Year 1977 and 1978, nearly 200 nominations were received in various categories, some of which were returned for local action and others were still pending final action. Actions completed during the Fiscal Year are detailed below.

(U) DOD Distinguished Civilian Service Award. Dr. Robert J. Eichelberger, Director, US Army Ballistic Research Laboratory, was among the six recipients of DOD's highest honorary award. He was recognized for his major contributions to science and weapon system technology.

(U) Decoration for Exceptional Civilian Service (DECS). The Secretary of the Army awarded the DECS to seven DARCOM employees for their outstanding and dedicated service to the Department of the Army. Achievements recognized included contributions to the science of fungal cellulose; the development, deployment and support of TOW; and to the areas of Weapons Systems Evaluation and mission and organizational planning and analysis.

³¹HQDA msg 181635Z Mar 77, Subj: Standard Civilian Personnel Management Information System (SCIPMIS).

³²DARCOM msg 121821Z Apr 77, Subj: SCIPMIS.

³³Memo of Understanding, 8 Sep 77, Subj: Implementation of Standard Civilian Personnel Management Information System (SCIPMIS) at ARRADCOM.

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(U) Meritorious Civilian Service Award (MCSA). During FY 1977, DARCOM granted the MCSA to seven employees for outstanding and dedicated service to the Army. An additional three awards were granted during FY 197T.

(U) Outstanding Federal Handicapped Employee of the Year Award. Mr. Charles H. Groom, an unsighted Supply Clerk from Frankford Arsenal, was winner of the DARCOM and DA Handicapped Employee of the Year Award. He received the DA Meritorious Civilian Service Award for his demonstrated proficiency on the job and his community activities in support of other unsighted individuals. Mr. Groom was further recognized in a Federal-wide competition as one of ten Outstanding Federal Handicapped Employees.

(U) Secretary of the Army's Award for Outstanding Achievements in Materiel Acquisition. The Secretary of the Army selected five DARCOM achievements for recognition. The individual and team achievements were as follows:

(U) Mr. William Kracov, HQ DARCOM, for innovations relating to pre-award surveys, quality assurance, tactical computer software and research and development acceptance testing.

(U) Mr. Otto H. Schoenberg, US Army Electronics Command, for his technical management in the development and fielding of the Proximity Warning Device which introduced a totally new avionics capability for Army helicopters.

(U) Mr. William A. Wondisford, US Army Armament Command (Benet Weapons Laboratory), for contributions to the development and implementation of the guided boring system for cannon tubes.

(U) Mr. Fred N. Newcomb, Aberdeen Proving Ground (US Army Human Engineering Laboratory), for innovative engineering techniques which improved the accuracy of the DRAGON Anti-Tank Missile System.

(U) Messrs. James T. Flood, Robert L. Hutchison, and Lawrence A. Runnels, US Army Aviation Systems Command, for their team efforts to the development of an Economic Price Adjustment Clause for use in Government procurement contracts.

(U) Army Research and Development Achievement Award (R&D). Sixteen achievements, covering 53 DARCOM members, were selected by Army for the 1977 R&D awards in recognition of unique contributions or single accomplishments by individuals and team members in the R&D community.

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(U) EEO Award. Once again this year, members of DARCOM were among the DA winners of the Award for Outstanding Achievement in Equal Employment Opportunity. Two of the five co-winners receiving the 1975-1976 award at the Secretary of the Army's Annual Awards Ceremony in October 1976 were Mrs. Anna T. Barron, US Army Natick Research and Development Command and Mr. Antonio C. Mendoza, US Army Test and Evaluation Command, White Sands Missile Range. This resulted in their designation as co-winners of DARCOM's ACTION Award.

(U) Daedalian Weapons System Award. The Daedalian Weapons System Award is sponsored by the Order of the Daedalians and presented annually on a rotating basis to the individual, group or organization of the Army, Navy and Air Force making the most significant contributions to weapon system development. DARCOM's nomination of the US Army Aviation Systems Command was selected as winner of the award for CY 1976 for the development of the Sikorsky UH-60A Utility Tactical Transport Aircraft System.

(U) Suggestions. Adopted suggestions resulted in reduced manhours; reduced cost of supplies, equipment, transportation and administrative services; reduced paperwork; and increased equipment life and increased production.

(U) A mathematician at MIRCOM (Sylvester F. Collette) saved the government \$1,064,533 through a suggestion which led to deletion of a requirement to procure additional dummy missiles. Existing stocks of basic HAWK dummy missiles were substituted for the major portion of improved HAWK training missiles. Mr. Collette was awarded \$2,165 for his suggestion (which was classified).

(U) Earl H. Smaltz, Electronic Technician, MIRCOM, saved the government \$3,663,500 by suggesting the purchase of an off-the-shelf target control system rather than participate in a tri-service development assigned to Navy. He was awarded \$4,765.

(U) Improving Productivity. Improving productivity through the effective use of awards was one of the FY 1977 objectives and will receive continuing attention during the coming year.³⁴

Career Management

(U) Screening and Referral. Fiscal Year 1977 was a year of continuing efforts to improve the career management screening and referral system in the Department of the Army. A project to revamp screening and referral methods proceeded with the introduction of

³⁴Ltr, HQ DARCOM, DRCPT-CRA, 30 Sep 77, Subj: DARCOM Wide Monetary Award Usage.

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revised screening and appraisal approaches in the Comptroller and Automated Data Processing Career Programs.

(U) SKAP. Of the twenty existing career programs, fourteen are utilizing systems oriented toward job-related skills, knowledges, abilities and personal (SKAP) characteristics. In conjunction with the Commanding General's assignment as Functional Chief, a steering committee was being established to develop a plan of action to improve the Engineer and Scientist Career Program under the jurisdiction of Mr. Norman Klein, the Assistant Deputy for Science/Technology. It was anticipated that FY 1978 would bring significant progress in this vitally important career program.

(U) CPR 950-1. The Civilian Personnel Office staff devoted a significant amount of time staffing and commenting on various draft revisions of CPR 950-1 (the basic career management regulation), to assure that DARCOM's interests were fully considered. It was anticipated that the regulation will be published in FY 1978 requiring major staff attention to its implementation during the Fiscal Year.

Training and Development.

(U) Apprentice Programs. In FY 1977 emphasis was placed upon increasing command participation in apprentice programs. The Commanding General requested that consideration be given to replacements of future vacancies within appropriate wage grade skills and crafts with apprentices. In the Facilities Engineer work grade force a commitment to fill 25 percent of future vacancies with Facilities Engineer Apprentice Program graduates became operative.

(U) Competitive Development Awards (CDA). In FY 1977, DARCOM continued its fine record of participation in the Competitive Development Award programs for which DA gives final selection. DARCOM received 100 percent of the DA quota for the Industrial College of the Armed Forces (5), 100 percent of the DA quota to National War College (1), and 25 percent of the DA quota to the Army Comptroller-ship School at Syracuse (2). Other CDA programs gaining DARCOM recipients were the Alfred P. Sloan Fellowships (2), Education for Public Management (3), the President's Executive Interchange (3), Logistics Executive Development (41), the Federal Executive Development III (3), and the Secretary of the Army's Research and Study Fellowship (2). All nominations for CDA were approved/disapproved by the DARCOM Executive Development Board prior to the Commanding General's final decision.

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(U) Computer Aided-Design. The fifth and final year of the CAD-E program at the University of Michigan finished in June 1977. Over the five year span of this graduate level program an average of 15 DARCOM employees per year, in grades 9 thru 13, were trained. Emphasizing theory and practical application, this training returned the engineers/scientists to their laboratories with training they could immediately put to use, encompassing the proper design of equipment using computer principles and techniques.

(U) Cooperative Education Programs. Dominant in the FY 1977 effort to make the Cooperative Work-Study Program a larger source of recruitment, particularly of minorities and women, was the attainment of authorization from DA for selected areas of DARCOM to experiment with partial tuition payments to Cooperative Education participants. These payments were possible for the junior and senior years of the work study cycle. Reports on effects of this policy will be closely analyzed, particularly as to the policy's effect on recruitment of minorities/women and on the retention of program graduates within the workforce.

(U) DARCOM Program Planning. FY 1977 saw DRCPT-CM's entry into the DARCOM Junior Program Guidance and Review Committee (JPGRC) which acted as a planning unit for the Command's Senior Selecting Committee on budgetary matters. The Career Management and Development Branch had two program elements it managed in coordination with the Comptroller and which were its concerns as a JPGRC member. These program elements were those for Civilian Executive Development and Long-Term Training. The former's funds for use throughout the command in FY 1977 totaled \$1,225,000. Centralization of LTT begins in FY 1978 and planning therefore in FY 1977 was very extensive. That planning resulted in a budget of \$1,500,000 and manpower spaces of 57 for FY 1978.

(U) Equal Employment Opportunity (EEO). The Career Management and Development Branch, coordinating with Headquarters EEO Office, in the latter portion of FY 1977, took measures to assure even greater consideration of minorities and women for future managerial development. All solicitation letters for nominations to HQ DARCOM controlled managerial development opportunities were to insist upon a report signed by commanders on the consideration methods and results for their minorities/women. These reports will enable Headquarters, DARCOM, to research further any needed action for qualifying these employee segments for meaningful promotional/lateral assignment consideration.

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(U) Intern Training Center. With the termination of a contract with Texas A&M University for graduate level engineering training at the Intern Training Center in Red River Army Depot the development of suitable government source modification in the training became necessary. In FY 1977, that modified training, based on formalized programs of instruction (POI), was achieved. The programs for Safety, Maintenance/Maintainability, and Product/Production interns were involved. Adjustments in agreements with interns and adherence to conditions of employment and in-house training requirements were achieved to the mutual satisfaction of all concerned.

(U) Executive Seminars. Exemplary of the desired growth in executive and managerial development within the command and DA was the great stride forward in participation by DARCOM in the US Civil Service Commission Executive Seminars. These seminars were designed to broaden conceptual understandings and enhance administrative abilities of high potential mid-career managers in grades 13 through 15. From the training of 39 at three centers and nine courses in FY 1976, the command progressed to a training of 139 at four centers and in nine courses in FY 1977.

(U) Training Requirements for Chemical Agents and Munition Security Personnel. In November 1976, programs of instruction (POI) were distributed to those commanders with DARCOM having civilian employees engaged as security personnel. The design of the POI's was the combined effort of the Career Management and Development Branch, the DARCOM Security Office, and their counterparts within DA. There were three POI's: a basic course of 51 hours, chemical security training of 24 hours, and an annual refresher of 44 hours (optional). The need for formalized POI's had been proposed by the DA Physical Security Review Board. After development, the POI's were forwarded to DA for its consideration for use outside of DARCOM.

Support Functions

(U) On-Site Staff Assistance. A total of 24 on-site staff assistance visits were made during the fiscal year by the Program Evaluation and Assistance (PE&A) Branch, CPSD. Most of the on-site assistance was directly related to reduction in force (RIF) actions and realignment. Typical assignments included: Audit CONCISE realignment and RIF, Pueblo Army Depot (PUAD), five days, one action officer; hands-on RIF assistance, Lexington-Blue Grass Army Depot (LBAD), ten days, one action officer; monitor AMARC realignment and RIF, ARRADCOM, three days, two action officers; recruitment assistance, Vint Hill Farm Station (VHFS), 20 days, two action officers. The reestablishment of on-site contacts during fiscal year 1977, which had been largely lacking for a period of two years or more, improved communications generally with the field and provided specific assistance, in most instances requested by the activity, in a timely and responsive manner. For example, the Personnel Management Specialist

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on TDY at Rocky Mountain Arsenal (RMA) furnished the technical expertise for the transfer of personnel services for RMA to Fitzsimmons General Hospital. This was necessitated by the departure of regular RMA CPO Technical staff members due to the cross-servicing decision. Similarly, at VHFS there was a need for expertise in the R&P area after the assumption of functions by DARCOM. The month-long TDY assignment of two Personnel Management Specialists from the PE&A Branch provided staffing expertise to VHFS on a timely basis where none was otherwise available within the needed time frame. Likewise, needed expertise was made available to HDL, on RIF-related matters. This resulted in RIF milestones met and lessons-learned RIF experience for the Harry Diamond Laboratories (HDL) CPO staff. In another instance, one Personnel Management Specialist was assigned TDY to Lexington-Blue Grass Army Depot (LBAD) for two weeks to assist the R&P Branch which had been depleted of technical personnel due to the RIF. These were typical of the assignments performed by the PE&A Branch members during staff assistance visits.

(U) Civilian Personnel Management Surveys. PE&A Branch members conducted or participated in the conduct of six on-site civilian personnel management surveys during FY 1977. Three were conducted by the PE&A Branch, two by DCSPER, DA, and one by the US Civil Service Commission. Findings were generally favorable although some irregularities in the Operation of the Merit Promotion Program were found at TARCOM/TARADCOM.

(U) In-Office Activities. The PE&A Branch assisted the Headquarters Operating CPO on a variety of activities during FY 1977. These included representing the CPO on merit promotion panels, participation in position classification surveys and in-placement actions. Manpower was loaned to the Career Management Support Branch (one-half man year) to manage career referral processes. Support also was provided to the DA Comptroller during the annual meeting (two weeks) of the Comptroller Career Screening Panel. Preparation of responses to IG Findings increased to a point in FY 1977 that this workload will be measured in the future. Delinquent Career Appraisals were the principal irregularities noted by the IG. Corrective action was taken by the involved installations in all instances.

(U) Career Management Support. This year was the first full year of operation for the Career Management Support Branch (CMSB). The workload remained very high with a total of 1,655 requisitions received. There was a substantial reorganization and restructure of the branch. This action and the manpower survey precluded the filling of all authorized positions. The manpower survey has not yet been implemented. The impact overall was the freeze of three spaces which were identified for withdrawal by the survey. Even with this condition

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the backload has remained at a very low level. Several career programs are expanding the use of the skills, knowledges, abilities and personal characteristics (SKAP) concept. This advancement will require adjustment in the operation of the branch. A significant accomplishment during the year was the automation of the Supply Career Program rosters following the finalization of their SKAP. As the other programs moved toward this system, more programs were eligible to be mechanized. An additional project initiated during the year was the reduction of the records through the utilization of MICROFICHE. The final leg of this program was the procurement of a reader printer which was anticipated to be concluded early in FY 1978.

(U) Materiel Acquisition and Readiness Executive Development. Support to the Materiel Acquisition and Readiness Executive Development (MARED) Program will continue to be at a high level. With the personal attention of the Commanding General, the program was receiving renewed interest and was approaching new and expanding efforts to secure nominees. The Commanding General informed the field that ways had to be found to increase the input of minority and females for the expansion of the program in the fall, calendar year 1977. Due to the Commanding General's desire for these greater efforts, the seminar planned for September 1977 was cancelled to provide time to develop these new approaches. During the year, there were over 400 applicants of which 166 were nominated, and 70 were selected by the MARED Board. Of these 70, four were minority but no women were selected. The 139 individuals currently in MARED have, in their first year and a half of activity, achieved 12 promotions, half of which involved an organizational change, 16 reassignments, eight temporary placements and 85 training courses, some of which included the 19 and 20 week Logistics Executive Development and Program Management courses. During the first 18 months of operation, 28 of the 1976 group withdrew. Reasons for withdrawal included placement outside DARCOM, inability of the employee to carry out the commitments of MARED such as mobility and intensive training, and promotion to grade 16.

(U) Special Recruitment and Career Intern Management. During FY 1977, the intern program was able to maintain a high level of fill for all programs which were centrally recruited. The E&S program remained decentralized and did not have the fill success of all other programs. As usual, the money problem kept constant pressure on dollars and required continuing effort to maintain adequate financial support. Up until the last moment there was the usual concern, but the problem resolved itself in the end. The main and continuing serious problem with the intern input was the shortage of available minority and female candidates. There was no new way to increase that input. In the past, our success had been due to the ability to make

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direct commitments at schools of individuals who were in the upper ten percent of the class. When that authority was removed we lost the means of getting the needed minority and female input. On-site reviews continued to produce better programs at the training sites. While some areas still required definitive local action, most sites responded to our findings and improvements were substantial.

Position and Pay Management

(U) DARCOM Grade Control Program. The DARCOM-wide 30 September 1976 average grade was .12 over the DA-assigned goal of 8.50. Eighty three percent of this increase occurred during the last quarter (FY 1977) when average grade rose from 8.52 to 8.62. Factors contributing to this increase included termination of summer hires plus substantial loss of low grade population due to RIF and minimal hiring because of fiscal limitations and prospective space reductions. Commands were informed³⁵ that the average grade control program would continue and that Secretary of Defense had directed a reduction of GS-13 and above positions during FY 1977/78. As a result of DA-assigned FY 1977/78 high grade/average grade reduction ceilings, GS high grade/average grade FY 1977/78 ceilings were assigned to all DARCOM commands, MSC-Reporting PM's and activities via policy letters.³⁶ By command decision, ceilings were based on 31 December 1976 TDA authorization data and were assigned following key management review and ceiling determination. Policy letters transmitted further guidance to commands.³⁷ Intensive management procedures were implemented in July 1977, including a special weekly report, to assure that DARCOM-wide high grade FY 1977 ceiling would be met. Some commands were required to restructure to achieve ceilings and in some cases actions were planned to achieve both FY 1977 and FY 1978 ceilings so as to avoid further turbulence in FY 1978. At DARCOM Commanders' conference, 12 October 1977, commanders were informed³⁸ that the FY 1977 DARCOM-wide filled GS average grade decreased from 8.62 (30 Sep 76) to 8.60 (30 Jun 77). A .04 decrease remained to be achieved and that it was anticipated that 30 September 1977 DA CIVPERSINS reports data (not available until on or about 25 October 1977) would reflect an average grade close to meeting the 8.56 FY 1977 ceilings. They

³⁵Ltr, DRCPT-CP, fr CG to DARCOM Commanders, "Reduction of Senior Level Civilian Positions," 15 Nov 76.

³⁶Ltr, DRCPT-CP, fr CofS to DARCOM Commanders, "Reduction of Senior Level Civilian Positions," 17 Mar 77.

³⁷Ltr, DRCPT-CP, fr Dir/PT&FD to DARCOM Commanders, "Reduction of Senior Level Civilian Positions," 14 Jun 77.

³⁸PT&FD briefing narrative and chart for Commanders' Conference, 12 Oct 77; DARCOM Average GS Grade - Filled Positions.

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were also informed³⁹ that the DARCOM-wide number of filled GS-13 and above including PL 313 positions during FY 1977 increased from 11,167 (Sep 76) to 11,199 (Jun 77), decreased to 10,743 (Sep 77) and was 189 below end FY 1977 DA-assigned ceilings (10,932).

(U) Affirmative Action - Executive Level Recruitment. During the third and fourth quarters FY 1977 DA directed affirmative action to ensure equal employment opportunity and quality staffing in executive level positions (GS-15 and above) and provided policy concerning executive search procedures and timely fill of supergrade level vacancies. Commanders were informed,⁴⁰ 8 September 1977, of the Secretary of the Army's EEO policy, the confirmation of the CG, DARCOM, DA and DARCOM procedures of expanded recruitment efforts for positions GS-15 and above, and timely fill of supergrade positions. Commanders were further advised on 13 September 1977 regarding search procedures for supergrade and PL 313 positions, career field positions (GS-15) and non-career field positions (GS-15), address listing of minority and female organizations for potential use in recruitment actions, and procedures to expedite timely fill of supergrade level positions.⁴¹

Schools Management

Introduction

(U) Lack of money continued to be the onus of the DARCOM schools (Army Logistics Management Center, ALMC; Army Management Engineering Training Activity, AMETA; and The Joint Military Packaging Training Center, JMPTC). The schools experienced their third consecutive year of budget cuts.

(U) FY 1977 saw the first graduates from courses conducted at ALMC for personnel participating in the Officer Personnel Management System (OPMS). The OPMS was developed by DA to enhance the training of officer personnel in the logistic management field.

Schools

(U) Training Accomplished. A total of 30,863 persons completed training that was offered by the three DARCOM schools. This included resident, on-site and correspondence courses training.

³⁹PT&FD briefing narrative and chart for Commanders' Conference, 12 Oct 77; DARCOM Reduction of Senior Level Civilian Positions GS-13 and Above Including PL 313 - Filled Positions.

⁴⁰Ltr, DRCPT-CP fr CG to DARCOM Commanders, "Affirmative Action to Ensure Equal Employment Opportunity & Quality Staffing in Executive Level Positions (GS-15 and Above," 8 Sep 77).

⁴¹Ltr, DRCPT-CP fr Actg Dir/PT&FD to DARCOM Commanders, same subject, 13 Sep 77.

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(U) Shortage of Funds. Due to shortage of P7S funds and travel target in FY 1977 only 6,891 DARCOM students were trained out of a requirement of 10,379 (66 percent).

(U) Officer Personnel Management System (OPMS). The Officer Personnel Management System (OPMS) program was implemented during FY 1977. It will eventually provide officer specialty training by the following courses: Project Manager Course; Research and Development (R&D) Management Course; Operation Research/System Analysis (OR/SA) Military Application Course I (MACI), OR/SA MACII, and OR/SA Continuing Education Program (CEP); Defense Procurement Management Course; and Defense Advanced Procurement Management Course and Defense Advanced Procurement Management Course and Logistics Executive Development Course. The first two offerings of the Project Manager Course will be accomplished in FY 1977. Plans were to implement the R&D Management Course and OR/SA MACI during FY 1978. The Defense Procurement Management Course, Defense Advanced Procurement Management Course, and Logistics Executive Development Course were on-going courses at ALMC prior to OPMS being adopted by DA; however, they supported OPMS specialties. OR/SA MACII and OR/SA CEP will not be implemented until additional manpower spaces and funds are made available.

(U) Security Assistance Training Program. The DARCOM Foreign Military Training Program dropped 48 percent from FY 1976 to FY 1977 due to cuts in the international military education and training funds. These cuts resulted in countries investing the larger portion of their funds in technical training rather than management type training.

Equal Opportunity Program

Introduction

(U) FY 1977 began amid some uncertainty pending the imminent revision of the entire Equal Opportunity Program in the Army. The impact on DARCOM, as other major commands, was that much of the usual directions and instructions from the headquarters were suspended until the finalization of AR 600-21, Equal Opportunity Program in the Army. Once the AR was completed, the local supplement was also finalized and distributed with the aim of initiating the revised program on its effective date of 1 September 1977. Assistance visits were up this year and this, along with extensive telephonic contact, was instrumental in keeping confusion to a minimum.

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The Revised Program

(U) Department of the Army sponsored a conference for all major commands during the period 16-19 November 1976, with task of finalization of the revised Army equal opportunity program. The end result was a single program consisting of two equal and complementary components: (1) the affirmative action component which consisted of a series of initiatives aggressively pursued to search out areas of inequity and discrimination to take corrective actions, and (2) an education and training component designed to maintain a high level of awareness concerning equal opportunity matter to all military personnel. For the first time the regulation included civilian personnel who serve as supervisors of military members. On 16 December 1976, the Director of Personnel, Training and Force Development was informed by Memo of the pending revisions.⁴² In January 1977, DARCOM subordinate commands were alerted to impending revisions in the EO program.⁴³ During the same period, the Chief of Staff, DARCOM, was given an assessment of DARCOM RR/EO programs.⁴⁴ In early February, a final draft of AR 600-21, Equal Opportunity Program in the Army was received and later distributed to DARCOM subordinate commands for review and recommendations.⁴⁵ Early in the month of April, the RR/EO received word telephonically from DA that the final draft had been approved and was being printed and had an expected distribution date of 1 July 1977. The DARCOM RR/EO Office began processing the DARCOM-R 600-3, Race Relations/Equal Opportunity and Equal Employment Opportunity Orientation and Training for publication and distribution.⁴⁶ The approved final draft was received by DARCOM from DA(DAPE-HRR) with direction to use this draft for the purpose of preparing a DARCOM supplement. By the end of the year, the AR with supplement along with DARCOM-R 600-3 had been distributed and the revised program was in effect. Commands were busy publishing supplements, rewriting education programs and attempting to adjust to this new program. The concern was to institute a name change to conform with the name of the Army regulation since the term "Race Relations" was eliminated.

⁴²DRCPT-R Memo, 16 Jan 77, Subj: Revision of Race Relations and Equal Opportunity (RR/EO) Army Regulation.

⁴³DARCOM DRCPT-R msg 102017Z Jan 77, Subj: RR/EO Training.

⁴⁴DRCPT-R Summary Sheet, 17 Jan 77, Subj: Annual Assessment of RR/EO Programs.

⁴⁵DRCPT-R ltr, 9 Feb 77, Subj: Draft Army Regulation AR 600-21.

⁴⁶DRCPT-R Fact Sheet, 24 May 77, Subj: DARCOM-R 600-3, Race Relations/Equal Opportunity and Equal Employment Opportunity Orientation and Training Program.

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Affirmative Action

(U) DARCOM EO conducted a workshop on the preparation of Affirmative Action Plans (AAP) with assistance from the staff of the Defense Race Relations Institute (DRRI). Representatives from throughout the command were present for the three day workshop which was designed to produce uniformity for all DARCOM units and was the first time that a MACOM conducted such training in the Army. In FY 1977, emphasis began to move to affirmative actions as opposed to monitoring actions. In April 1977, the Secretary of the Army transmitted a message emphasizing affirmative actions.⁴⁷ Shortly thereafter DARCOM received a draft AAP from HQDA. The DARCOM AAP was revised and was scheduled for distribution during the first quarter of FY 1978.

Education and Training

(U) As previously cited, training in DARCOM was in dormant condition during the year due to the recent change. Training requirement changed in the AR as civilian supervisors were included for the first time. DARCOM Regulation 600-3 was published in August 1977 and some changes were also included, the major change being the elimination of the requirement to train non-supervisory civilian personnel. A review of the DARCOM regulation was underway to determine if there was a need to maintain this regulation in its present form or eliminate it and include the contents in a supplement to the Army regulation. The DARCOM-R 600-3 was unique only because it included the requirement to train civilians, but that uniqueness was removed with the new Army regulation.

Monitoring

(U) In addition to staff assistance visits a new report was initiated in FY 1977 to improve our monitoring apparatus. This report was received quarterly and provided statistics on military justice, general education development, and training. Also, it presented a narrative to point out accomplishments as well as problems at subordinate commands. Staff assistance visits were conducted to four major subordinate commands, eleven depots and other activities for a total of 12 assistance visits compared to nine visits last year.⁴⁸ In April, DARCOM Regulation 600-4, Race Relations and Equal Opportunity Narrative and Statistical Report (RCS DRCPT-304), was finalized.⁴⁹

⁴⁷DA msg 151911Z Jun 77, Subj: Affirmative Actions for Equal Opportunity.

⁴⁸(1) Trip rpt 18 Nov 76, Subj: Race Relations and Equal Opportunity Staff Assistance Visit - US Army Electronics Command (29 Sep-1 Oct 77); (2) Trip rpt 23 Jun 77, Subj: Race Relations and Equal Opportunity Staff Assistance Visit to Red River Army Depot.

⁴⁹DARCOM Form 2268-R (RCS DRCPT-304).

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Special Emphasis Activities

(U) One area of the program that was not affected by the revision was the special emphasis activities which included cultural events. The first event was Martin Luther King's Birthday which was celebrated on 14 January.⁵⁰ National Afro-American (Black) History Week was observed the week of 13-19 February 1977.⁵¹ The year ended with National Hispanic Heritage Week, 11-17 September 1977.⁵² In addition to these major events, other ethnic and cultural activities throughout the command were celebrated. Guest speakers were used at most of the events but budgetary restraints prevented use of nationally known figures as in past observations. All indications were that even on a reduced budget the programs were successful.

Alcohol and Drug Abuse Program

Introduction

(U) When compared to Department of the Army and other Federal agencies, the DARCOM Alcohol and Drug Abuse Prevention and Control Program (ADAPCP) was a leader during FY 1977 in the number of personnel assisted. Yet, much work needed to be done to increase participation in the program. Those programs within DARCOM that could be designated as excellent programs acquired excellence as a result of active personal involvement of commanders, extensive educational programs, and effective interventional skills of program staff.

Prevention

(U) During FY 1977 the prevention and education phase of the program was emphasized. It was only through continued and extensive educational programs that employees received factual information which enabled them to examine attitudes toward the problem of alcoholism and other drug abuse. Orientation for non-supervisory personnel exceeded the DARCOM goal, but the goal established for supervisory training was not reached.⁵³

⁵⁰DA msg 132037Z Dec 76, Subj: Anniversary of the Birth of Dr. Martin Luther King, Jr. and Afro-American (Black) History Observances.

⁵¹DARCOM msg 182054Z Jan 77, Subj: Afro-American (Black) History Observances.

⁵²Guthrie sends msg 101722Z Sep 77, Subj: National Hispanic Heritage Week.

⁵³3rd Qtr Progress Report.

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Identification and Rehabilitation

(U) The number of personnel admitted to the program during FY 1977 was less than FY 1976. That decrease in admission resulted from a decrease in the number of personnel admitted for drug abuse. As of 30 August 1977, the end of the month caseload was 512 clients.⁵⁴

Evaluation

(U) Staff assistance visits were conducted at 19 installations.⁵⁵ The purpose of these visits was to provide technical assistance and evaluation of the programs. These visits not only assured that policy and regulations were observed but also that the program received increased visibility and emphasis.

Accomplishments

(U) During this fiscal year, the Headquarters program provided assistance to 89 employees. Of this total, 67 employees were seen for problems other than alcohol or drug abuse. In the area of prevention and education, supervisory training was conducted as part of basic supervision and refresher training. Since the number of these courses was limited, supervisory training was scheduled to be held independently of these courses.⁵⁶ Non-supervisory orientation was conducted for approximately 450 employees.

Staff

Directorate

(U) William S. Charin, Deputy Director, became acting director upon the reassignment of Brigadier General Lawrence S. Wright in July 1977. In March 1977, Major Eugene Kennedy was assigned as Chief, Race Relations and Equal Opportunity Office, vice Captain Arlene Greenfield, reassigned.

⁵⁴ ADAPCP Summary (RCS: CSPA-1291)

⁵⁵ Schedule of DARCOM Alcohol & Drug Abuse Prevention and Control Program Staff Assistance Visit.

⁵⁶ HQ DARCOM ADAPCP Training for Supervisors, 3 Oct 77.

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Personnel Strength

(U) At the end of FY 1977, authorized spaces (no change from end of FY 1976) were as follows:

| <u>Element</u> | <u>Officer</u> | <u>Enlisted</u> | <u>Civilian</u> | <u>Total</u> |
|---|----------------|-----------------|-----------------|--------------|
| Office of Director | 2 | | 3 | 5 |
| Plans & Admin Office | | | 4 | 4 |
| Race Relations & Equal Opportunity Office | 1 | 2 | 3 | 6 |
| Alcohol & Drug Abuse | | | 5 | 5 |
| Civilian Personnel Division | | | 38 | 38 |
| Force Development Division | 2 | | 45 | 47 |
| Military Personnel Division | <u>7</u> | <u>3</u> | <u>25</u> | <u>35</u> |
| | 12 | 5 | 123 | 140 |

Personnel Support Activity

(U) During fiscal year 1977, the Personnel Support Activity had two organizational changes. They were: (1) the Organizational Effectiveness Office was established using four spaces (two military, two civilian) from within authorized resources; (2) the finance personnel records maintenance functions for military personnel with three supporting spaces were transferred from Headquarters Military Personnel Office to the Military District of Washington, effective 1 November 1976. The personnel authorization was changed as follows:

| | <u>OFFICERS</u> | <u>WO</u> | <u>ENL</u> | <u>CIV</u> | <u>TOTAL</u> |
|-------------------|-----------------|-----------|------------|------------|--------------|
| 1 October 1976 | 8 | 0 | 7 | 227 | 242 |
| 30 September 1977 | 8 | | 6 | 225 | 239 |

Comptroller

Mission

(U) The mission of Comptroller was to: provide direction for, and supervise overall management of financial matters; establish and prescribe procedures for DARCOM resource forecasting, budget system, cost analysis, economic analysis, management research and analysis, accounting systems, internal review, audit compliance, and review and analysis of command programs; determine and obtain financial resources required to accomplish missions of DARCOM; supervise the DARCOM Cost

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Analysis Program; develop and maintain an effective financial and management control system, and procedures for safeguarding and achieving optimum use of resources; provide analysis of mission and program accomplishments, and resource availability, obligation, and utilization as a basis for management decisions; provide management analysis of management systems, methods, and techniques as a basis for improving management within DARCOM; direct the DARCOM Productivity Improvement Program; serve as Functional Chief for the Comptroller Career Program; direct the DARCOM Internal Review Program and the audit of nonappropriated funds; serve as principal point of contact for the General Accounting Office (GAO), Deputy Assistant Secretary of Defense (Audit) (DASD Audit), and the US Army Audit Agency (USAAA).

(U) Selected in December 1976 as the first civilian Comptroller of DARCOM, Mr. Richard H. Ruhland died unexpectedly on 4 September 1977. Brigadier General Alfred J. Cade was named Acting Comptroller.

Overview

(U) During FY 1977, the major objective of the Comptroller Directorate was to improve the financial management and the administrative control of funds throughout the command. In general, the improvements noted in FY 1977 reflected some of the major initiatives of FY 1976. This period marked the first full year in which the revised procedures implemented under the DA Financial Management Improvement Program (FMIP) had been extended to all DARCOM activities. These changes in part coincided with the successful realignment of funding programs to bring them in consonance with the AMARC reorganization. Several former problems were resolved by transitions to the programs developed to support AMARC and CONCISE and by the increased funding provided by DA in recognition of these requirements.

(U) Also a major improvement was made in another problem of long standing - Foreign Military Sales (FMS). Here, the revision of DA and DARCOM procedures to facilitate the consolidation of FMS financial management initiated earlier by DOD had positive results. Working in consonance with Defense Security Assistance Agency (DSAA) and other services, new joint procedures were developed, coordinated, promulgated, and implemented during FY 1977. As part of this major change, over 6,000 FMS cases were updated, reconciled, audited, and transferred to the DSAA Joint Financial Management Office (JFMO). As the fiscal year closed, all DARCOM elements were actively participating in and supporting the consolidated DOD FMS program.

(U) Throughout the fiscal year numerous key actions having local impact were initiated or implemented by higher direction. One local action initiated reflecting the Commander's increased concern

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for overall management improvement was the Command Performance Indicator Review (CPIR) program. The CPIR's were established to keep the Commander and other key personnel informed on various facets of Command operation and were briefed to the CG on a scheduled basis. Another staff action was an improved monthly financial update by which the Commander and key personnel jointly reviewed the status and progress of all appropriations and funding programs.

(U) As the fiscal year drew to a close, the increased importance and effort directed to the Program Analysis and Resource Review (PARR) and to Zero Base Budgeting (ZBB) as future planning and management tools foretold of the major areas of emphasis expected during FY 1978.

(U) Charts 8 thru 12 represent the Comptroller Funding Programs for FY 1977.

(U) Certain actions were successfully completed without major disruption of operations. These included the realignment of field element funding responsibilities due to AMARC, the transfer of two depots from US Army Europe to DARCOM, the transfer of the Electronics Materiel Readiness Activity (EMRA) from the Army Security Agency, new budgeting and funding procedures for FMS Administrative fees, and the implementation of fixed prices at AIF installations.

Resources and Programs

(U) Extensive effort was placed on meeting the perpetual problem of decreased fund availability and increased program requirements. Successful management actions along with increased funding by DA for AMARC and CONCISE resolved major problems.

(U) The advent of Zero Base Budgeting provided a new technique for allocating limited resources from among competing program needs. The preparation of the Program Analysis and Resource Review (PARR) by the Comptroller resulted in a positive response by DA in approving program requirements.

(U) Emphasis on regulating the use of Contingency .012 funds resulted in the appointment of the DARCOM Commander as the Certifying and Approving Officer (CAO) for HQ DARCOM. A letter signed by the CG stressed the importance of administering the FY 1977 program equitably to avoid unplanned year-end buying.

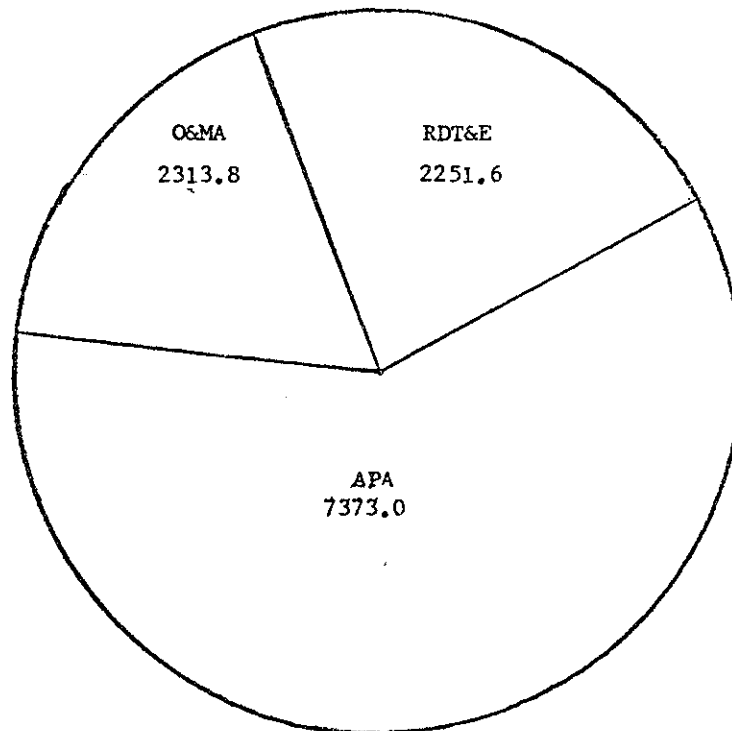
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ARMY PROGRAMS RECEIVED APPROPRIATIONS (MILLIONS OF DOLLARS)

As of 30 September 1977

Total FY: \$11,938.5



| FISCAL YEARS | TOTAL RECEIVED | OMA | APA | RDT&E |
|-----------------|-------------------|---------|----------|---------|
| 75 | 12,667.0 | 1,970.5 | 7,364.1 | 1,561.6 |
| 76 | 18,605.4 | 2,188.5 | 11,385.0 | 3,462.6 |
| 77 | 2,274.4 | 534.6 | 995.1 | 425.1 |
| 77 | 11,938.5 | 2,313.8 | 7,373.0 | 2,251.6 |

Chart 8

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APA FUNDING FY 1977 (MILLIONS OF DOLLARS)

As of 30 September 1977

| FISCAL YEAR | PC 2031 | MI 2032 | DDO 2033 | MMIO 2034 | STP 2035 | TOTAL |
|--------------------|------------|------------|-------------|--------------|-------------|---------|
| <u>Available</u> | | | | | | |
| 75 | 28.8 | 68.9 | 52.8 | 109.9 | 82.8 | 343.2 |
| 76 | 96.5 | 209.4 | 334.4 | 236.7 | 258.1 | 1,135.1 |
| 7T | 22.7 | 28.3 | 172.1 | 99.2 | 136.0 | 458.3 |
| 77 | 622.4 | 768.2 | 1,450.9 | 1,245.7 | 1,349.2 | 5,436.4 |
| TOTAL | 770.4 | 1,074.8 | 2,010.2 | 1,691.5 | 1,826.1 | 7,373.0 |
| <u>Obligated</u> | | | | | | |
| 75 | 13.4 | 54.6 | 24.4 | 58.1 | 35.6 | 186.1 |
| 76 | 38.7 | 107.3 | 118.1 | 138.5 | 119.9 | 522.5 |
| 7T | 10.2 | 19.1 | 99.0 | 63.7 | 95.9 | 287.9 |
| 77 | 473.8 | 663.8 | 1,212.9 | 1,016.9 | 974.5 | 4,341.9 |
| TOTAL | 536.1 | 844.8 | 1,454.4 | 1,277.2 | 1,225.9 | 5,338.4 |
| <u>Unobligated</u> | | | | | | |
| 75 | 15.4 | 14.3 | 28.4 | 51.8 | 47.2 | 157.1 |
| 76 | 57.8 | 102.1 | 216.3 | 98.2 | 138.2 | 612.6 |
| 7T | 12.5 | 9.2 | 73.1 | 35.5 | 40.1 | 170.4 |
| 77 | 148.6 | 104.4 | 238.0 | 228.8 | 374.7 | 1,094.5 |
| TOTAL | 234.3 | 230.0 | 555.0 | 414.3 | 600.2 | 2,034.6 |

Chart 9

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* O&MA FUNDING
FY 1977
(MILLIONS OF DOLLARS)

As of 30 September 1977

| Appropriation | Direct | Funded Reimbursable | Automatic Reimbursable | Total |
|---------------|---------|------------------------|---------------------------|---------|
| Available | | | | |
| Program 7S | 1,003.1 | 86.8 | 145.2 | 1,235.1 |
| Program 7M | 851.2 | 39.8 | 37.2 | 928.2 |
| Other Prgrms | 126.7 | 19.2 | 4.6 | 150.5 |
| Total | 1,981.0 | 145.8 | 187.0 | 2,313.8 |
| Obligated | 1,968.8 | 92.2 | 187.0 | 2,248.0 |
| Unobligated | 12.2 | 53.6 | -0- | 65.8 |

* P10 funds in the amount of \$215.4 million (received and obligated) not included under automatic reimbursable.

Chart 10

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RDT&E FUNDING
FY 1977
(MILLIONS OF DOLLARS)

As of 30 September 1977

| | FISCAL YEAR | DIRECT | REIMBURSABLE | TOTAL |
|-------------|----------------|---------|--------------|---------|
| Available | 76 | 38.9 | 12.1 | 51.0 |
| | 7T | 93.1 | 9.3 | 102.4 |
| | 77 | 1,817.4 | 280.8 | 2,098.2 |
| | TOTAL | 1,949.4 | 302.2 | 2,251.6 |
| Obligated | 76 | 36.5 | 11.5 | 48.0 |
| | 7T | 92.7 | 9.0 | 101.7 |
| | 77 | 1,742.6 | 226.2 | 1,968.8 |
| | TOTAL | 1,871.8 | 246.7 | 2,118.5 |
| Unobligated | 76 | 2.4 | 0.6 | 3.0 |
| | 7T | 0.4 | 0.3 | 0.7 |
| | 77 | 74.8 | 54.6 | 129.4 |
| | TOTAL | 77.6 | 55.5 | 133.1 |

Chart 11

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WHOLESALE ARMY STOCK FUND FY 1977 (MILLIONS OF DOLLARS)

As of 30 September 1977

| | PROGRAM | ACTUAL |
|------------------------|---------|---------|
| Obligation - End of FY | 892.7 | 852.6 |
| Sales | 949.7 | 937.6 |
| Collections | — | 860.0 |
| Cash | 151.9 | 195.2 |
| Accounts Receivable | 65.9 | 127.7 |
| Inventory | — | 2,347.9 |

Chart 12

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(U) Programming. The first Program Analysis and Resource Review (PARR) prepared under the auspices of the Comptroller was submitted to DA on 28 February 1977. The submission was the culmination of intensified efforts to involve the DARCOM subordinate commands in the program development process. As a result, the DARCOM PARR contained justification for an additional \$884.6 million above guidance in all appropriations. Annex J of the program objective memorandum approved an additional \$233.7 million which was reflected in the May Program and Budget Guidance.

(U) Zero Base Budgeting (ZBB). Zero Base Budgeting (ZBB) concepts were used for the first time in the preparation of the FY 1977 Operation and Maintenance, Army (OMA) budget. With the release of the President's Memorandum of 14 February 1977, it was recognized that ZBB procedures would be used in developing FY 1979 budgets and the Resources and Programs Division began to evaluate its impacts. Upon receipt of advanced copies of initial ZBB instructions from DA, which covered Base Operations Activities only, Resources and Program representatives met with Base Operations managers at all DARCOM levels in the budget process. Initial instructions were issued on 22 April 1977 to DARCOM field elements financing Base Operations activities.

(U) In addition to the basic instructions received from DA for Base Operations, the Resource and Program Division issued an information booklet entitled "Zero Base Budgeting in DARCOM" to the DARCOM Headquarters staff and all DARCOM elements reporting to DARCOM Headquarters. The booklet outlined the overall basic concepts of ZBB, DARCOM's involvement to date for all appropriations, and a listing of ZBB references.

(U) Due to late receipt of instructions from DA, ZBB implementation for mission activities was effected at the HQ DARCOM staff level. Based upon advanced guidance received from DA, instructions for the DARCOM Headquarters staff implementation of ZBB were issued on 7 June 1977, the day prior to the release of formal instructions by DA.

(U) In response to a DA request, a paper entitled "Zero Base Budgeting (ZBB) Experience at DARCOM"⁵⁷ was furnished on 22 July 1977 to the Comptroller of the Army Budget Formulation Office. The paper included an overview of the scope of DARCOM's mission and resources, rationale for and ZBB procedures implemented, problems encountered, lessons learned and objectives achieved, and outlook for FY 1978.

⁵⁷Zero Base Budgeting (ZBB) Experience at DARCOM, compiled by DRCCP, 22 Jul 77.

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(U) Among the problems addressed were the dual reporting requirements resulting from the addition of ZBB implementation requirements to conventional COBE requirements, the short time-frame provided for the preparation of both submissions, the need for better definitions and structure of fund levels, the addition of ZBB for mission activities after the conventional budget preparation was in process, and the need for a DA publication and training courses on ZBB within the Army.

(U) Achievements included the increased active participation at all levels of management, particularly in the Base Operations area, due to its emphasis at the top levels. In addition, the requirement to follow a disciplined ranking process resulted in managers and successive levels of reviewing authorities taking a closer look at the risks and alternatives available in the application of resources and developing a budget based on priorities as viewed at each level.

(U) OMA Resources. The principal problem confronted in executing the OMA budget during FY 1977 was the continuing gap between available fund resources and program requirements in the P7 Supply and P7 Maintenance Programs. This included long standing problems such as Backlog of Maintenance and Repairs (BMARS), Care of Supplies in Storage (COSIS), and support of new program requirements.

(U) These shortages necessitated some management actions by DARCOM during the fiscal year in order to assure support of highest priority requirements, and thus provide a partial solution. DA provided funds to cover the remaining gap. DA also provided funds for one-time costs for AMARC and CONCISE.

(U) The following represents the OMA funding for FY 1977:
(Millions of Dollars)

| <u>FY 77 CBE</u> | <u>FY 77 COBE</u> | <u>FY 77 BER</u> | <u>FY 77 FINAL FUNDING</u> |
|------------------|-------------------|------------------|--------------------------------|
| 1,895.8 | 1,860.2 | 1,944.2 | 1,981.0 |

(U) Budgeting for Foreign Military Sales Administrative Management Costs. On 9 September 1976 the Deputy Secretary of Defense directed that the financial management of Foreign Military Sales (FMS) be centralized. Included in the directive was the requirement that FMS administrative costs be managed through a budgetary process. In compliance, the DARCOM FY 1977 FMS Administrative Budget Estimate, submitted 1 February 1977, was the first of its kind to price out costs incurred in managing the FMS Program.

(U) The first FMS budget presented to DA included in its estimate \$54.5 million for OMA, \$.5 million for RDTE, and \$2.5 million for MPA. To enable DARCOM activities to use FMS funds, an automatic reimbursable order system was developed to reimburse Army appropriations from FMS Trust funds.

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(U) Scope of AIF Operations. During FY 1977, DARCOM operated the following installations and activities under the Army Industrial Fund (AIF) System: one subordinate command, seven arsenals, twelve depots, and four research and development facilities. Action taken to extend AIF to two additional Test and Evaluation (T&E) facilities was not approved. To the contrary, OSD directed that a study be made to remove two existing T&E facilities from AIF and to recommend another prefinancing technique. The RDTE carrier concept proposed by DARCOM was accepted with an effective date of 1 October 1979 (FY 80).

(U) Three Navy Industrial Plants were transferred to DA/DARCOM via PBD actions in December 1976. The effective date for this action was 1 October 1977 (FY 78). The FY 1977 AIF operating program totaled over \$1.9 billion.

(U) FY 1978 AIF Annual Budget. The FY 1978 AIF Budget Estimates, as submitted to DA, reflected the following operating data:

| | (Millions of Dollars) | | |
|-----------------------|--------------------------|-----------------------|-----------------------|
| | FY 1976 <u>Actual</u> | FY 1977 <u>Est</u> | FY 1978 <u>Est</u> |
| Orders | 1,853.7 | 1,948.6 | 2,076.7 |
| Revenue | 1,855.5 | 1,911.6 | 2,017.5 |
| Costs | 1,861.4 | 1,920.6 | 2,001.4 |
| Civilian End Strength | 71,191 | 68,012 | 66,767 |
| Civilian Man-years | 72,681 | 68,900 | 66,608 |

Adjustments made by DA and the Program Budget Decisions issued by OSD revised the budget estimates as follows:

| | (Millions of Dollars) | |
|-----------------------|-----------------------|----------------|
| | <u>FY 1977</u> | <u>FY 1978</u> |
| Orders | 1,920.7 | 2,100.5 |
| Revenue | 1,901.0 | 2,023.8 |
| Costs | 1,924.6 | 2,004.3 |
| Civilian End Strength | 65,145 | 66,449 |
| Civilian Man-years | 68,202 | 67,577 |

(U) AIF Rate Stabilization Program. Fixed Prices/Fixed Rates were implemented in the Depot AIF System during FY 1977 in lieu of setting stabilized direct labor hour rates for Supply, Maintenance and all other areas. Fixed Prices have also been implemented to the maximum extent in all other AIF installations. Composite Rates were not being required by OSD where Fixed Prices/Fixed Rates were in effect. An Internal Review Program was established by Internal Review and

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Audit Compliance Office to review the actual implementation of Fixed Prices/Fixed Rates (OSD's Rate Stabilization Program) at the industrially funded installations.

(U) Fast Payback Capital Investment Program. DA allocated an additional \$1.0 million AIF cash to DARCOM to finance the Fast Payback Capital Investment Program. This action assured the full implementation of this program without any impact on existing AIF cash requirements for operations.

(U) AIF Budget vs Customer Budget. DCSLOG required that the Direct OMA Appropriation Customer Budgets earmarked in the COBE for in-house AIF operations be identical with the OMA Direct Customer Orders listed in the AIF Budget submission. In addition, the financed man-years designated in the DARCOM COBE submission for all AIF installations will likewise be utilized in the AIF Budget to reflect these manpower data.

(U) OMA Travel Limitation. A travel target was continued for OMA programs during FY 1977. This continued procedures instituted in FY 1975 in line with Congressional desire to reduce expenditures for these purposes. The travel target included all direct obligations charged to element of expense 21. Although targets were not an administrative subdivision of funds under RS 3679, DARCOM was obligated to control expenditures within assigned dollar limits.

(U) Management of Contingency Funds of the Secretary of the Army. To insure that all limitation .012 funds were used and managed strictly in accordance with AR 37-47 and the DARCOM Supplement thereto, a letter was prepared and signed by the DARCOM Commanding General indicating that each commander or head of an agency would personally approve the use of these funds. To carry out this responsibility, commanders or agency heads will serve as Certifying and Approving Officers (CAO) and perform the functions set forth in paragraph 8, AR 37-47.⁵⁸ The DARCOM Commanding General was appointed CAO for HQ DARCOM.

(U) Control of Year-End Buying. By memorandum, dated 14 June 1977, President Carter directed that action be taken to control spending in the fourth quarter of the fiscal year. The President's directive was amplified and passed down within DOD by a memorandum from Secretary Brown and within Army by a memorandum from the Vice Chief of Staff. To prevent inappropriate spending, the President directed that obligations for the fourth quarter could not exceed obligations for the third quarter except for: seasonal requirements,

⁵⁸Ltr, DRCCP, 25 Aug 77, Subj: Management of Contingency Funds of the Secretary of the Army.

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essential programs, or to restore slipped programs. A letter was prepared by the Resources and Programs Division and signed by the DARCOM Commanding General emphasizing the importance of executing the FY 1977 program in accordance with scheduled obligation plans and avoiding unplanned year-end buying.⁵⁹

(U) Base Operations Support Funding at NARADCOM. An extensive review of base operations funding at NARADCOM was conducted. Since base operations support was the responsibility of the host organization, and NARADCOM's mission was primarily research and development, it was concluded that the RDTEA appropriation should initially finance all base operations support (BOS) costs and all BOS spaces should be reflected against a RDTEA code on the Table of Distribution and Allowances (TDA). The proposed change will not affect the direct dollar requirements for either OMA or RDTEA. A target date of 1 October 1978 (FY 79) was established for changing the carrier program from OMA to RDTEA.

(U) Industrial Preparedness Program Funding. Comprehensive funding guidance was developed for the Army Industrial Preparedness Program and published in a change to AR 700-90. The Army Industrial Preparedness Program included several distinct areas of activity: Producibility Engineering and Planning (PEP), Manufacturing Methods and Technology (MMT), and Military Adaptation of Commercial Items (MACI). PEP encompassed those planning and engineering projects that were undertaken by the materiel developer commencing with feasibility studies and extending through prototype production to insure that a specific end item/component is capable of quantity production. PEP projects were RDTE financed as a part of the specific weapons system involved. MMT projects were undertaken by the materiel developer to bridge the gap commencing with the completion of prototype production and extending to the beginning of full scale production. Also, MMT projects were normally broad-based in application, were production oriented even when they were performed in a prototype environment, and therefore, were financed from PA and OMA. MACI included those projects undertaken by the materiel developer to explore the feasibility and practicability of procuring or otherwise obtaining a currently available non-developmental end item, assemblage, component, or part, in order to satisfy an established Army requirement. In general, if it was deemed necessary to perform a technical evaluation and assessment on a non-developmental item prior to initiating procurement to satisfy an operational or inventory requirement, the cost of procuring, testing, and reconfiguring sufficient off-the-shelf samples of such items was charged to the RDTE appropriation when the item proposes to meet a new requirement and to the Procurement appropriations when the item was intended to be used as a substitute or replacement item.

⁵⁹Ltr, DRCCP-BP, 28 Jul 77, Subj: Control of Year-End Buying.

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(U) Procurement/Purchase of Nonstandard Nonstocked Items of Supply and Equipment Funding. Comments and dollar impact were provided DA on a proposed change whereby a direct citation of applicable operating (consumer) funds would be required for the procurement of nonstandard nonstocked expense-type items. Requisitions and purchase orders for nonstandard nonstocked items of supply and equipment would no longer be initially funded by the local retail stock fund, but would be funded by consumer funds totally. Consumer funds would be obligated on the basis of submission of the requisition through the normal installation supply channels for execution of the purchase order or contract (local procurement). The effective date for this policy change for DARCOM was 1 October 1977.

(U) Transportation Costs Funding. At the direction of the DARCOM Comptroller, an information paper was prepared to provide a general reference on transportation funding policy.⁶⁰ It included a broad overview of DARCOM funding responsibility, definitions of first and second destination transportation funds, an explanation of Army Stock Fund transportation policy and some special provisions for funding transportation under selected conditions, such as retrograde, frustrated shipments, industrial stocks, vehicle target program and redistribution of excess materiel.

(U) Tunnel Detection System Funding. A review of the Tunnel Detection System revealed that much of OPA funds for this project were applied to payments of civilian salaries, travel, TDY, contractor support and other non-hardware operational requirements by reimbursements through AMS Code 728012.16. This funding appeared inappropriate. In response to an inquiry to DA, DARCOM was directed to fund these requirements in FY 1977 direct with OMA funds (program 2) with no reimbursements from OPA; \$946 thousand for this was provided by DA.

(U) OMA Reimbursable Expenses Associated With Deliveries Against Grant Aid (GA) and Foreign Military Sales (FMS). During FY 1977 there were three major significant changes for collecting earnings for P7S in the FMS program procedures:

(U) Procedures for advancing Administrative Changes from the FMS Trust Fund to the OMA appropriation were discontinued due to difficulty experienced with accounting/billing costs incurred in support of FMS.

(U) DARCOM decentralized the OMA funded reimbursement program to the major subordinate commands instead of direct obligation authority made available through conversion of Funded Reimbursable (FR)

⁶⁰Inclosure to ltr, DRCCP-BP, 2 Aug 77, Subj: Procedures for Funding Army Transportation Costs.

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authority of HQ DARCOM. This change was to place reporting and fund accountability for funded reimbursements at the local level and to assure greater control over utilization of funded reimbursements.

(U) Established procedures for centralization of FMS billings, cash collections, trust fund accounting and administrative fee management through DSAA at the Security Assistance Accounting Center (SAAC), Denver, Colorado. Funding Authority for FMS Administrative Management costs was established as an automatic reimbursable order at DARCOM activities.

(U) Electronic Materiel Readiness Activity (EMRA). Under Project ATHENA, as the result of the Intelligence Organization and Stationing Study (IOSS), the Electronic Materiel Readiness Activity (EMRA) (formerly Materiel Support Command (MSC)) was transferred in place at Vint Hill Farms from the Army Security Agency to DARCOM. The funding responsibility was transferred effective 1 October 1976 with assumption of full responsibilities for EMRA on 1 February 1977. During FY 1977 the Army Security Agency at Arlington Hall provided the finance and accounting support to EMRA on a non-reimbursable basis. EMRA remained as a consolidated National Maintenance Point (NMP), NICP and depot operation for all EW/SIGNIT equipment and supplies. One hundred and sixty five personnel transferred to DARCOM were funded in Program 38 and the augmentation of additional 65 personnel were funded with Program 7S and Program 7M. The transfer also included reimbursement for issues of EW/SIGNIT items to tactical units in Program 20 and to Strategic Units in Program 38. It also provided funds in Program 20 to cover commercial maintenance contracts on selected EW/SIGNIT equipment.

(U) US Army Depot at Mainz and US Army Depot Activity at Ober-Ramstadt. The responsibility for the operations of the US Army Depot at Mainz and the US Army Depot Activity at Ober-Ramstadt in Germany was transferred from US Army Europe to DARCOM. Also, the funds in P7S and P7M were transferred to DARCOM and issued directly to Mainz and Ober-Ramstadt. However, the operational control of these two plants was under DESCOM. Their respective mission and functions included the following:

(U) US Army Depot, Mainz - Overhaul/repair heavy combat vehicles, self-propelled artillery, tank recovery vehicles; cranes and related assemblies and components. This plant, US Government-owned and contractor-operated, accomplished an annual program in excess of \$50 million.

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(U) US Army Depot Activity, Ober-Ramstadt - Repair and rebuild pneumatic tires and track suspension system components in support of command stocks and other customers, accomplished annually a rubber item overhaul and fabrication program in support of USAREUR's Materiel Readiness effort.

(U) Software Support for Tactical Data Systems. The software support for tactical data systems was transferred from US Army Computer Systems Command to DARCOM and assigned to Project Manager, Army Tactical Data Systems at Fort Monmouth, with Software Support Centers at Fort Sill for the TACFIRE, and at Fort Bliss for the Missile Minder. This transfer was funded in Program 2.

Cost Analysis

(U) Extensive effort was placed on review and validation of weapon system cost estimates including Review and Command Assessment of Project (RECAP), Logistic Command Assessment of Projects (LOGCAP), DA Program Reports (DAPR), and Product Improvement Proposals (PIP). A DARCOM Guide for processing Cost and Operational Effectiveness Analyses (COEA) cost data was completed, published and distributed. New applications for mathematical modeling in cost estimating were explored and the expanded use of interactive computer services were initiated.

(U) The Cost Analysis Division gained responsibility for Economic Analysis with the transfer of that function from the Management Division. Resources were committed in the area of Operating and Support Costs (O&S Cost); specifically, Goals and the Visibility and Management of O&S Costs (VAMOS) User Survey. Major activities included coordination, direction and participation in the preparation of Independent Parametric Cost Estimates (IPCE), Baseline Cost Estimates (BCE) and COEA's.

(U) DARCOM Guide for COEA Cost Data. During FY 1977, the "DARCOM Guide for Management and Control of COEA Cost Data" was developed and published. This document supplemented the joint TRADOC-DARCOM Guide published in September 1976. Significant features included: (1) procedures for functional operations of COEA Cost Advisory Groups and SAG Cost Subgroups; (2) definition of roles, responsibilities and interfaces among TRADOC, DARCOM and COA; (3) flow charts to assist in understanding and implementing the new process; (4) significant events and activities as standard milestones for common reference throughout DARCOM, TRADOC, and COA; (5) an extensive checklist for specific actions to be considered at each of the standard milestones; (6) an illustrative Gant chart for display and tracking of the standard milestones; and (7) a generalized PERT model to serve as a basis for developing a critical path network for completion of the weapon system under study.

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(U) Cost Analysis Career Program. During this fiscal year, the Cost Analysis Field of the Comptroller Civilian Career Program was modified to include coverage under a new career appraisal system involving the identification and rating of Skills, Knowledges, Abilities and Personal Characteristics (SKAP). DARCOM participated in this process through review and preparation of extensive comments based on command-wide staffing of Headquarters DA draft proposals for the SKAP package. Implementation of the SKAP procedures will be accomplished during early FY 1978.

(U) GSRS Special Task Force. This office provided membership to the General Support Rocket System (GSRS) Special Task Force, directed by the DARCOM Commander to review, validate and justify the proposed FY 1978 Congressional reprogramming action. Upon conclusion of review, the Team reported its findings and recommendations to Commander, MIRADCOM, DARCOM Deputy Commanding General for Materiel Development, and the Deputy Chief of Staff for Research and Development at HQDA. The Task Force specifically was directed to conduct an in-depth review of the FY 1978 proposed increase in scope and the balance of effort associated with the 29-month competitive Validation Phase prior to awarding of the contract.

(U) Operating and Support (O&S) Cost Goals. Cost Analysis Division prepared a document, in coordination with TRADOC and FORSCOM, which described various means of expressing operating and support cost goals for Army weapon systems. Numerous goals were suggested for systems in the DSARC process for which the Government and the Contractor would be responsible. These goals were segregated into the development and production phases of the program. The study was but one step toward OSD's objectives of Life Cycle Cost Goals and the reduction of out-year operating and support costs.

(U) Deobligation Forecast Model. In response to a request by the Associate Director for Programs, Procurement and Production Directorate, a methodology for forecasting deobligation was developed. Financial data covering 18 fiscal quarters was subjected to various statistical procedures to arrive at a model for predicting deobligations as a function of program size. It was agreed that the data used in developing the model would be updated at the end of the fiscal year. The model resulted in a table of factors by which deobligations could be determined as a percentage of total program size.

(U) RCA Price Model. The Deputy Commander for Materiel Development requested an evaluation be made of the suitability of the RCA Price Model for Cost Estimating for use in DARCOM. A preliminary test program in a limited number of commodity areas was conducted during the period April 1976 through April 1977. Following this test

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program, a survey of model users was conducted. This survey resulted in identifying the need for expanded tests of the model to evaluate its use in other DARCOM commodity areas. Results of the preliminary test programs were not definitive enough to support a conclusive recommendation for command wide application. Further testing of the model was initiated and the results of this effort were to be evaluated in April 1978.

(U) Operating and Support (O&S) Costs. In response to a DA message dated 2 March 1977, this Headquarters conducted a study to assess the requirements of Army organizations for operating and support cost information and to examine the feasibility of satisfying these requirements through the development of an Army Operating and Support Cost Management Information System (O&SCMIS). In general, this included a survey of potential users to assess their needs for an Army O&SCMIS, the evaluation of existing and new data sources to determine suitability for use in an O&SCMIS, the examination of several sample data collection techniques as a means of filling data voids, and the correlation of user requirements with data sources to subjectively evaluate the potential quality of output from an Army O&SCMIS. The study was completed, a final report written, and a briefing provided for DCSLOG and COA on 8 July 1977.

(U) Inflation Guidance. A consolidated inflation guidance letter was issued on 14 December 1976. The letter furnished new composite indices prepared by COA for use in development of the FY 79-83 POM, the FY 1979 Budget, and Selected Acquisition Reports (SAR) as of 31 March 1977. New OSD inflation indices and guidance for their application were released to DARCOM Field elements on 30 September 1977. The OSD indices superseded previous DA Guidance in all areas except preparation of the FY 80-85 PIP POM. In the future, OSD inflation indices will be used in lieu of service generated indices.

(U) Product Improvement Program (PIP). The joint DA/TRADOC/DARCOM review of FY 1979 PIP submissions was accomplished during the period 27 October to 5 November 1976. Subsequent to the review, the Cost Analysis Division furnished the Office of Product Improvement with after action comments that emphasized: (1) the necessity for cost and economic analyses; (2) that project sheets should be submitted in final form; (3) that this office be provided feedback information that indicates approvals, disapprovals, or requests for additional cost data; (4) that the PIP Review Agenda indicate the order in which the PIP's, identified by number, were to be reviewed.

(U) LOGCAP. The requirement for LOGCAP, the Logistics and Command Assessment of Projects, was established by DARCOM Regulation No. 1-41. Input was provided by the Cost Analysis Divisions for

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those portions of the regulation which pertained to cost presentation formats and the procedure for identifying cost elements to the logistics categories. The division also reviewed and validated the cost data of LOGCAP briefings presented in FY 1977.

(U) Project Manager Orientation Course. An extensive briefing on Cost Analysis was prepared and provided at the Orientation course for new Project Managers established during FY 1977. Representatives of the HQ DARCOM Cost Analysis Division and the ALMC Cost Analysis instructor staff provided the briefing for two courses conducted during the year. The Headquarters portion of the briefing was directed to an overview of the Army/DARCOM Cost Analysis Program with focus on what key things new PM's should know. The ALMC portion of the briefing stressed examples of cost analysis studies and techniques.

(U) Pershing Operating and Support Cost Model. A special PERSHING Operating and Support Cost model was devised by Martin Marietta of Orlando, Florida, for the PERSHING Missile. This O&S model was sensitive to input changes involving maintenance concepts, design changes, spare parts percentages, and fuel consumption. Cost Analysis Division worked with the PM PERSHING and the Contractor on the perfection of these life cycle cost tradeoffs.

(U) XMI Facilitization Cost. At the direction of Commander, DARCOM, the Cost Analysis Division undertook a review of the facilitization cost originally for 30 XMI tanks/month for a quantity of 3312. In July 1977, a further review of the increased costs for 90 tanks/month for quantities of 7500 and more was also undertaken. This office expressed concern regarding the overall cost of this effort (over \$1 Billion) and indicated that considerable review and reduction was necessary. Review of the contractor and each major subcontractor with substantial facilitization costs was scheduled for November 1977 through January 1978. Cost Analysis Division personnel were scheduled to participate directly on this review.

(U) Cost Curves and Trust Fund Analysis. An examination was made of financial data regarding the adequacy of the balance of the Army Trust Fund, and the amount of cash that should be advanced to each Army Appropriation to maintain a 90-day level of customer disbursements. Based on this examination, a report was prepared of the methodology and data used by the Department of Army in financial management. Analytical material presented in the report was used for briefing HQDA and DARCOM management personnel in the concepts of the Army Trust Fund.

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(U) Weapon System Evaluation Case Study. A Cost Analysis case study was prepared in briefing style format to illustrate one aspect of weapon system evaluation. The case study focused on the macro analysis of cost and program data provided to senior officials during a key review point in the materiel acquisition management process. Insights were provided to the classical problem of cost growth which were generally applicable to complex weapon systems.

(U) Depot Security Study. An evaluation was made of a Directorate for Plans and Analysis study concerning defense of nuclear ammunition depots from terrorist attack. Based on the Cost Analysis review, an extensive revision of the study was required by AMSAA, the performing agency. This office provided direct assistance to the Directorate for Plans and Analysis in identification and determination of appropriate cost estimating and analysis techniques.

(U) DIMES Type System for Cost Analysis Division. A DIMES type work measurement system was implemented in two branches (DRCCP-EM and DRCCP-EV) of HQ DARCOM Cost Analysis Division on 8 February 1977. The purpose of the System was to assist in quantifying manpower requirements by specific task and activities. Data collected was summarized and analyzed after the first nine weeks; the second nine weeks data was also summarized and analyzed and then compared with the first nine week period. After the objectives of the system were achieved, it was terminated on 1 July 1977.

(U) Army Special Tank Task Force. At the direction of the Army Chief of Staff, a special tank task force was formed to carry out the major recommendations of the Tank Management Task Force chaired by Lt Gen Kalerges (Ret.). The Special Tank Task Force was formed to develop recommendations on costs and requirements for a Special ASARC. TARCOM, TARADCOM and the tank project offices (XML, M60TD, M60TP) were asked to provide specific input to the task force for various quantities and rates of production. These costs, when completed, were briefed to Commander, ARRCOM, without validation. At the DARCOM review in early July 1977, Commander, DARCOM, directed the DARCOM Cost Analysis Division to validate all Tank Project Offices, TARCOM, and TARADCOM input to the Task Force, and upon completion of this task, to review the cost data in the Special Army Task Force Report. All of the validation required was completed and both Commander, DARCOM, and Chairman, Special DA Tank Task Force, were notified of findings. Findings were used to correct the briefing charts for the Special ASARC and the final Task Force Report.

(U) Independent Parametric Cost Estimates. DOD policies governing the materiel acquisition process required an Independent Parametric Cost Estimate (IPCE) for each major weapon system undergoing a milestone review by the Defense Systems Acquisition Review Council

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(DSARC). Additionally, selected IPR systems required an Independent Cost Estimate (ICE) for systems undergoing a review by the Army Systems Acquisition Review Council (ASARC). The IPCE or ICE, prepared within Comptroller, Cost Analysis channels independent of the influence and control of either the contractor(s) or project manager concerned, was used to assess the reasonableness of the PM's estimate of the cost resources required to complete the program.

(U) Review and Command Assessment of Project (RECAP) and Department of the Army Program Report (DAPR) Presentations. RECAP's and DAPR's covering technical performance, schedule and cost information on selected weapon systems were prepared each quarter coinciding with the SAR submission by the Project Managers. RECAP's were submitted to the HQ DARCOM level and DAPR's to HQDA because of special interest in those projects at that level. During FY 1977 ROLAND AAH and UTTAS were under the DAPR system and the below listed projects under the RECAP system.

- | | |
|------------------------|--------------|
| 1. CH-47 Modernization | 9. GLLD |
| 2. PLD | 10. COBRA |
| 3. HELS | 11. ASE |
| 4. PERSHING | 12. SEMA |
| 5. STINGER | 13. PATRIOT |
| 6. UTTAS | 14. HELLFIRE |
| 7. CH-47D | 15. VIPER |
| 8. IAP | 16. I-HAWK |

(U) Baseline Cost Estimates (BCE) and BCE Reassessments. Baseline Cost Estimates were normally prepared by the Project Management Offices and reviewed and coordinated by the Cost Analysis Offices at the Major Commodity Commands and HQ DARCOM. Initial BCE's form the basis for audit trail/track throughout the life cycle of a weapon system. Reassessments were made at major decision points and tracked to the initial BCE. The following systems required BCE's or reassessments during FY 1977:

- | | | |
|----------------|----------------|-------------------------|
| 1. AN/TTC-39 | 11. FAMECE | 20. AAH |
| 2. AN/TPQ-36 | 12. UET | 21. STINGER |
| 3. SOTAS | 13. XM-204 | 22. GSRS |
| 4. DIVAD | 14. XM-1 | 23. ISH |
| 5. SAW | 15. SLEEP | 24. TADS/PNVS |
| 6. TOS | 16. FASCAMS | 25. CH-47 Modernization |
| 7. TSS | 17. LWCMS | 26. UH-1 |
| 8. IFV/CFV | 18. COPPERHEAD | 27. AH-1 |
| 9. ITV | (CLGP) | 28. OH-58 |
| 10. BUSHMASTER | 19. UTTAS | 29. CH-47C |

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Finance and Accounting

(U) The Finance and Accounting Division's major emphasis during FY 1977 was directed toward improving and strengthening the finance and accounting structure to effect a more efficient utilization of resources. Evidence of this major thrust was visible by actions such as the centralization of FMS billings, cash collection, trust fund accounting and administrative fee management at the Security Assistance Accounting Center (SAAC). Further evidence included the establishing of ten new General Operating Agencies (GOA) under DARCOM; and the attempt to obtain General Accounting Office (GAO) approval of DARCOM accounting systems.

(U) Free Assets. A certain amount of materiel sold by the Army was not replaced in kind. This may have been items no longer used by the Army or items which had been improved, and the sold item that was replaced by an improved model. Such sales were classified as Augmentation and Modernization (AM) sales and collections from such sales were known as free assets. Cash from these sales could not be utilized by DARCOM and problems had been encountered in identifying and controlling these free assets. In January 1977, procedures for manual reporting of free assets were provided to the MSC's. It was determined after several months that a faster reporting technique was required other than inclusion as a special limitation on the monthly reports. With insight developed from the PFCS design and implementation, it was decided to incorporate Free Asset Management and Reporting into PFCS. Control Data Corp completed the design and programming efforts for the Army in September 1977, and implementation will be in FY 1978.

(U) Financial Management of Cooperative Logistics Supply Support Arrangements (CLSSA). Revised DOD/DA policies and procedures for financial management of CLSSA's were implemented to DARCOM Materiel Readiness Commands and USAILCOM, 1 August 1977. The revised procedures provided for, in the main, the financing of FMS requirements from cash deposits made by the foreign customer. Also, the new policy required writing of SSA's in terms of an absolute dollar amount of support to be provided under the arrangement. Previous policy required a list of specific items to be furnished to the foreign government. The initial implementation will require the use of off-line techniques. Plans were to include the procedures in CCSS and CIS-IL as soon as possible.

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(U) Centralization of FMS Billing, Cash Collection, Trust Fund Accounting, and Administrative Fee Management. On 9 September 1976 the Deputy, Secretary of Defense (DSD) directed the centralization of the subject function at the Security Assistance Accounting Center in Denver, Colorado. It was the decision of the Commanding General of DARCOM that the Materiel Readiness Commands' billings should be submitted directly to SSAC with information copies going to USAILCOM to maintain the central Army data base. Financial forecasting was submitted through USAILCOM for consolidation prior to submission to SAAC. ROID's were submitted by the FMS customer directly to SSAC which in turn forwarded the ROID's to USAILCOM for submission to the appropriate supply source. The Deputy Secretary of Defense directed SAAC to become operational by November 1976 for the big three countries; i.e., Iran, Israel, and Saudi Arabia, and by January 1977 for all the other countries. To accomplish this crash project, DRCCP-F issued approximately 225 pieces of correspondence and 19 systems change requests and attended approximately 30 meetings with representatives from various activities.

(U) AIF Inventory Management. The DARCOM proposal for managing retail inventories at the Depots within the Army Industrial Fund in lieu of the Stock Fund was approved by OSD on 18 August 1975. This system was developed, programmed, tested and prototyped at Letterkenny, Red River and Tooele Army Depots during FY 1977. This AIF Inventory Management system was implemented at the remaining depots on 1 October 1977.

(U) Write Down on FMS Orders. Due to the large unobligated balances in the customer Programs for Fiscal Years 1975 and 1976 APA accounts, the Acting Comptroller of the Army issued new policies and procedures to reduce the FY 1975 and FY 1976 unobligated balances. Based on HQDA guidance, DARCOM directed its subordinate commands to write down FMS orders classified RP (sale from procurement) or CP (customer peculiar item) to the committed/obligated amount for fiscal years 1975 through 1977. All FMS orders for the same fiscal years, except FY 1975, classified RS were required to be written down to the highest of commitments, obligations, or earnings. Fiscal year 1975 RS (sale from stock) orders were directed to be written down to the higher of obligations or earnings.

(U) Implementation Team for Financial Management (ITFM). A HQDA team including two full time HQ DARCOM representatives was established with the prime objective in two OSD(C) MEMORANDUMS dated 17 June 1977 and 3 October 1977. The development of an automated accounting system to control FMS obligational authority (OA) by the ITFM (DARCOM representatives) has led to the assignment of these two representatives to the Army Project Manager, Procurement Funds Control

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System. The DARCOM representatives published HQ DARCOM implementation guidance which was approved by HQDA and have been instrumental in the planned procurement of a mini-processor for the extension of the financial FMS OA module of CIS-IL.

(U) Improvements to Financial Management of FMS. The draft revision of DODI 2110.29 placed a requirement on SAAC and the Services to control FMS contracts (obligational) authority (FMS OA). The FMS OA was provided to USAILCOM by SAAC which in turn distributed the FMS OA to the MRC's. Procedures were provided to DARCOM field activities to accomplish the above distribution of FMS OA. ALMSA prepared a DFSR for automation of the FMS OA processing. Revisions to the FMS OA/DFSR procedures were to be required to implement the recent guidance from OSD to implement ASD memorandum dated 17 June 1977 with the above subject. An implementation team was established at DA to develop an automated system to control FMS OA at USAILCOM and to pass the OA to the MRC's.

(U) Year-End Reporting. The established DARCOM Comptroller's objective of achieving "unqualified certifications" for year-end reporting was reemphasized again this year. In the course of accomplishing this objective, all subordinate commanders were directed to apply their resources to the task of purifying financial records. Task forces were dispatched from this headquarters for the purpose of monitoring this assignment. As a result of this effort, all subordinate commanders rendered unqualified certifications.

(U) Administrative Charges on FMSO #1 Cases. As a result of a review made at USAILCOM-NCAD of open FMSO #1 cases, it was determined that the five percent administrative surcharge had not been billed/collected on 46 of these cases. The total amount due was estimated to be approximately \$2 million. On 21 July 1977, a billing was submitted to the Security Assistance Accounting Center (SAAC), Denver, Colorado, by the DARCOM Comptroller requesting reimbursement from the FMS Trust Fund. SAAC reviewed the FMSO #1 cases applicable to Iran, Saudi Arabia and Israel and, as a result, reimbursed the Army an amount in excess of \$980 thousand. Subsequent reimbursements will be accomplished when SAAC completes their audits of the other countries' cases.

(U) Comptroller General Approval of DARCOM Accounting Systems. The current inventory of DARCOM accounting systems requiring documentation and submission to GAO for review and subsequent recommendation to the Comptroller General for approval/disapproval included HQ DARCOM Fund Control System (HQ DFCS), Commodity Command Standard System (CCSS), Centralized Integrated System for International Logistics (CISIL), Standard Depot Management Information System (SDMIS), and General Ledger portion of Team-up.

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(U) The HQ DARCOM Fund Control System was documented and submitted to GAO for review 24 February 1977. No problem statements were issued to date and recommendations for approval were expected. The parameters for CCSS were established and system discussed at a DA, GAO, ALMSA, DARCOM joint meeting on 18 October 1977. Documentation procedures were begun with first submission expected in May 1978. Changes in system parameters and GAO requirements necessitated the redocumentation and submission of SDMIS, formerly SPEEDEX; due date to be established. General Ledger portion of Team-up and CISIL were deferred, the former until testing of automated R&D system was completed, and the latter until the system parameters were established.

(U) Program and Fund Control System (PFCS). During the first quarter of FY 1977, the Comptroller of the Army initiated action for the design and implementation of an automated system to control program and funds for the Procurement Appropriation. This action was based on a recommendation by the Financial Management Advisory Committee (FMAC). Under contract with Control Data Corporation, the general system design and the specific Phase I design were worked out and implemented 30 June 1977. This phase allowed the control and release of APA program and funds from HQDA to the appropriate major commands. Working in conjunction with DARCOM and USACC, Phase IA through III were designed in the preliminary. These phases were respectively, Free Asset Management and Reporting (Phase IA) MACOM/SOA Program and Fund Release/Reprogramming for direct Army Funds (Phase II) and the Customer Order Program (Phase III). The Free Asset Management phase was in the process of implementation as of 30 September 1977. Problems in the design of this phase resulted in a drastic slow down of work on the remaining two phases. In addition, Phase III underwent major revision in which the FMS OA control was abstracted from PFCS and built into a separate Army Customer Order Control System (ACOCS). As now constituted Phase III will control the issue and management of Funded Reimbursement Authority (FRA). Since the scope of Phase III was reduced, it was combined with Phase II and they have been targeted for implementation March 1978.

(U) Direct Cite Funding. With the establishment of the Security Assistance Accounting Center (SAAC) in Denver, DARCOM was given the Army wide responsibility of issuing and controlling expenditure limitations for the direct citation of FMS Trust Fund. Procedures were developed and established to accomplish this assignment.

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(U) Section 506. Under authority of Section 506 of the Security Assistance Act, the President was authorized by Congress to provide military assistance to Southeast Asia with funding authorization to be provided later. The President exercised this authority in FY 1974 and FY 1975; however, funding authorization was not provided until July 1976. An audit determined that prices charged to the Military Assistance Program were overpriced. From guidance developed by a series of meetings by representatives from DA, DARCOM and ARRCOM, ARRCOM submitted a proposal to accomplish the objectives of collecting for materiel shipped at agreed to prices. The proposed procedure was approved by DA and represented the simplest, most effective method for completing the project. All required billings and adjustments were completed.

(U) Nonnuclear LANCE (NNL) Testing Costs. The Nonnuclear LANCE warhead problem has been a very sensitive and volatile subject since FY 1974. The on-again, off-again uncertainty of funding had generated several cycles of correspondence in the past. In FY 1977 the NNL program became a reality and this firmly established participation by the US Government created the question, "Should the US Government pay a pro rata share of the start-up and DT III testing costs associated with this program?" In a precedent setting decision by HQDA it was determined that once prices had been established and funding provided for start-up and DT III costs, later changes in volume would not change the original costs. It was further determined that in those rare instances where initial production of a revised model is for a foreign government, one advantage of producing such weapons is that any knowledge, technology, or retention of our production base belongs to the US Government. It is according to the DA decision, not legally or fiscally sound for the US Government to pay a foreign country for something that already belongs to the US Government.

(U) Decentralization of the OMA Funded Reimbursement Program (FRP) for IL/GA. A successful decentralization of the OMA Funded Reimbursement Program was accomplished during FY 1977. As a further operational enhancement, a proposal was submitted to COA to finance PCH in support of FMS under the same procedures as FMS Administrative support costs. Adoption of this proposal will in effect remove FMS PCH costs from the OMA FRP and commodity command. Under this proposal automatic reimbursement procedures will be performed and billed by DESCOM.

(U) Reimbursement of Defense Contract Administration Services (DCA) on FMS Cases. HQDA (COA) adopted the DARCOM proposal to require the DCASR's to bill JFMO/SAAC directly with no financial involvement on the part of DARCOM. However, due to the limitations of the JFMO/SAAC systems, difficulties are being experienced which means that the Army

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will probably require the commodity commands to come to the aid of JFMO/SAAC by performing the reimbursement function to the DCASR's.

(U) Proposed Implementation Plan for Processing Billing Documents Via the DAAS. This plan was a coordinated system for automatic distribution of billing documents through the Defense Automatic Addressing System (DAAS) using the Defense Communications Agency (DCA) Automatic Digital Network (AUTODIN). The DAAS prototype in December 1976 at AVSCOM was successful in processing billing documents via the DAAS. Because of this success, the other major subordinate commands became operational in January 1977. Automatic processing of billing documents via the DAAS was designed to reduce manual distribution processing, and eliminate the need for supply activities to maintain Communications Routing Identifier files for billing purposes. Further, it expedited the billing process and inter-fund adjustments through electrical transmission of documents, and improved accuracy in the transmission of documents. Finally, the procedure standardized document transmission throughout the Department of Defense.

(U) Reimbursement to DCAA for Contract Audit Costs Associated with FMS. An initial position was established which emphasized DARCOM's non-financial involvement in accomplishing reimbursement to DCAA from the FMS Trust Fund. However, JFMO/SAAC again could not accommodate an arrangement for honoring bills directly from DCAA. Consequently, we were forced to establish procedures to bill each applicable commodity command. The commodity commands are using the APA's as a carrier for these charges until collections are accomplished from JFMO/SAAC. In response to our request, DCAA is attempting to establish procedures for a SAAC budget.

(U) Turkey Grant Aid Suspension and Subsequent Cancellations. In February 1975 the US Government announced its decision to suspend all shipments of military assistance - Grant Aid items to Turkey. This suspension did not cancel the MAP Orders already in existence. However, during FY 1977 Turkey requested that a number of the items on order be cancelled and the funds appropriated for these be used for other Turkey requirements. These developments impacted DARCOM and the Finance and Accounting Division as exemplified in the following case. Based upon decisions made in a meeting of supply and international logistics personnel of DSAA, HQDA, DARCOM and ECOM AR 16-20, May 1977, a number of open Turkey MAP Orders were reduced or cancelled. To accomplish this a number of requisitions placed on ECOM were cancelled. The ECOM Comptroller became aware of this action on 18 August 1977 and immediately raised the issue of a possible RS 3679 violation resulting from these cancellations. Two meetings were held; on 25 August 1977 at USAILCOM-NCAD and 7-8 September 1977 at DARCOM Headquarters, to resolve the issue raised. As a result of these meetings,

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ten program lines and applicable requisitions were reinstated since these requirements were already on contract. A secondary benefit from these meetings is the lessons learned by the logistics functionals that customer orders cannot be cancelled without Comptrollers concurrence/coordination.

(U) Financing of Overhaul/Renovation and other Depot Maintenance Cost Related to Non-Army Sales of PA Items (OMA/PA Split). In conjunction with HQDA revised procedures were prepared for the above subject for FY 1978. These procedures called for the proceeds from the sale of Army procurement accounts (APA) items to non-Army customers to be deposited to APA. The rebuild of items to replace these items sold from stock will be financed from OMA. The only exception to this procedure was where the item sold from stock was above the admission and disposition. These procedures were promulgated to DARCOM activities with an effective date of 1 October 1977 for implementation.

(U) Foreign Military Sales - Testing Costs - Uniform Overhead Rates. TECOM proposed a technique for the establishment of a uniform rate for the recovery of overhead costs at TECOM test facilities on foreign military sales (FMS) orders. This proposal applied only to the recovery of overhead costs (i.e., indirect costs at test facilities) relative to recurring production tests. The major problem evident in the TECOM proposal was that FMS customers of the test facilities with high overhead rated (e.g. White Sands) will be subsidized by FMS orders placed with low overhead test facilities (i.e. Aircraft Development Test Activity). This proposal was not adopted due to the numerous inequities for all FMS customers relative to the recovery of indirect overhead costs.

(U) Single Pricing Policy for Secondary Items. Replacement pricing for secondary items involving FMS had been a continuing problem. Subject policy was developed by the DARCOM Comptroller Directorate and was submitted to the Comptroller of the Army for approval. On 8 June 1977, the acting Comptroller of the Army approved the implementation of subject policy. Consequently, a computer systems change request was developed and processed to ALMSA for incorporating this policy into Commodity Command Standard System (CCSS). In addition, a briefing was provided to the major Readiness commands' Comptrollers on the techniques involved in the single pricing policy for secondary items.

(U) FMS Trust Fund Advances to Army Procurement Accounts (APA). Prior to the transfer of the Army FMS Trust Fund to DSAA/SAAC, the Army was experiencing a heavy drain on the APA cash accounts. This negative cash flow condition was primarily due to the APA's financing progress payments to contractors with reimbursements occurring far in the future at the time of delivery. In order to alleviate this condition, procedures were established to "push" advances from the Army

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FMS Trust to APA's for major item procurement. However, with the advent of DSAA/SAAC/JFMO takeover of the FMS Trust Fund, Financing and Accounting Division began making advances based on the "pull" concept; i.e., commodity commands advance bill DSAA/SAAC based on contractor progress payments anticipated to be requested by contractors in each subsequent month. Those advance procedures were instrumental in maintaining cash solvency of the Procurement Appropriations. In this regard, the acting Comptroller of the Army dispatched a letter early in the second quarter of this fiscal year requiring that earnings be reflected for contractor requests for progress payments. Originally this Division attempted to implement this COA directive with the billings for advance payments from the FMS Trust Fund serving as a basis for earnings. The necessity for this approach was as a result of inaccurate accounting classifications furnished by DCASR's for contractor progress payments. Finally, because the Acting Comptroller of Army nonconcurred with our original implementation which established earnings in advance of the contractor progress payments, we reestablished pro-rations of DCASR progress payments as a basis for earnings records.

(U) Finance and Accounting Surveillance Program. New checklists on the above subject were issued in the areas of Military Pay, Financial Management and Accounting, Quality Assurance and Civilian Pay. The pre-visit questionnaire was revised to assist the surveillance teams in preparation for the visit. Accounting Surveillance checklists were being modified to afford greater coverage by utilizing fewer but more meaningful and productive checklist items.

Internal Review and Audit Compliance

(U) The fifth annual Internal Review and Audit Compliance Workshop was held during 9-11 November 1976 in El Paso, Texas. Participating in the workshop, which was hosted by White Sands Missile Range, were representatives from HQDA, DARCOM installations, the Army Communications Command, FORSCOM, and TRADOC.

(U) Command-wide internal review activities provided a well balanced coverage of installation operations and procedures. The Internal Review Branch (DRCCP-IR) rendered assistance to several installations relative to alleged violations of RS 3679. In the meantime, DARCOM Headquarters' internal review personnel played a major role in the reconciliation, validation and audit of Foreign Military Sales Accounts prior to their transfer to the Security Assistance Center. The Internal Review Branch (DRCCP-IR) developed and implemented a procedure to facilitate successful accomplishment of follow-up actions on external audit reports.

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(U) Continuing emphasis was placed on coverage of areas encompassed in the Financial Management Improvement Program (FMIP). DARCOM internal review offices were directed to structure their FY 1978 programs so that approximately half of the workload would be centered around FMIP.

(U) Concerted efforts to improve DARCOM's performance in processing external audit positions to DA Headquarters resulted in the attainment of an 85 percent on-time record. The command-wide on-time goal remained at 93 percent. Documented results of the Comptroller's campaign to improve the quality of DARCOM positions on external audit reports indicated that satisfactory progress was made toward achievement of the command-wide goal.

(U) During FY 1977, DARCOM was involved in 24 cases alleging violation of RS 3679 or administrative violation of AR 37-20. At the end of the year, half of these cases had been closed and the remaining active cases were in various stages of review or investigation. With regard to each of the 12 closed cases, DA review resulted in a determination that no violation occurred. The greatest deterrent to more rapid closeout was the inordinate amount of time taken by DA/DOD for case review.

(U) Early in the fiscal year, the Army Audit Agency initiated a new concept of advisory audit reports. The new series of reports was designed to assist commanders in the field through the identification of problems of wide interest that were documented during regular audits. Of particular significance was the advisory report on administrative control of funds which received the personal attention of the Commanding General, DARCOM.

(U) Based on formal DARCOM (DRCCP) recommendations, DA published a revised version of Chief of Staff Regulation 26-1, US General Accounting Office Reports and Related Requirements. The principal changes required DA staff agencies to take certain actions in support of the continuing campaign to improve the timeliness and quality of DARCOM/DA positions on GAO audit reports.

(U) Internal Review Performance. The command-wide internal review functions provided a well-balanced coverage of installations operations, procedures and activities. Assistance was rendered by the Headquarters Internal Review Office to several installations relative to alleged violations of the 3679 Revised Statutes.

(U) The Internal Review Branch played a major role in the reconciliation, validation and audit of Foreign Military Sales Accounts prior to the transfer of these accounts to the Security Assistance

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Center. Personnel from this office were on TDY to USAILCOM, New Cumberland, Pennsylvania during October and November 1976 and during the months of January to July 1977. Approximately 5800 FMS Case files were reconciled and validated.

(U) The DARCOM Headquarters Internal Review Office developed and has implemented a procedure which will facilitate successful accomplishment of follow-up requirements. The procedure will provide the basis for instant determination of the status of corrective action taken or contemplated in response to any recommendation contained in US General Accounting Office, US Army Audit Agency, and Defense Audit Service reports. An inventory of audit reports issued to DARCOM commands, installations, and activities during fiscal years 1975-1977 identified 94 reports containing 347 findings having a total of 816 recommendations for which the status of follow-up needed to be determined. Follow-up action may have been taken by subordinate internal review elements on many of the 816 recommendations. Nineteen letters, requesting the status of follow-up on each of the 94 audit reports were forwarded to the appropriate subordinate commands and installations. In addition to follow-up at subordinate commands and installations, certain audit reports contained recommendations directed to HQ DARCOM. Twenty reports containing 99 recommendations directed to HQ DARCOM elements were identified. Follow-up reviews on these recommendations will be cleared up during the 2d Qtr FY 1978.

(U) Special emphasis was continuing on coverage of areas encompassed in the Financial Management Improvement Program (FMIP). DARCOM internal review elements were informed that they were to structure their FY 1978 programs so that approximately 50 percent of the workload will be centered around FMIP.

(U) Timeliness of DARCOM Responses to External Audit Reports. Implementation of the Comptroller's multi-year program to improve DARCOM's performance in processing external audit positions to DA Headquarters on time resulted in a reversal of the downward trend which began in FY 1975. However, FY 1977 performance (85 percent on time) fell short of command's ultimate goal; i.e., 93 percent on time. Following is a tabulation of reply timeliness performance for the past five years:

| <u>Fiscal Year</u> | <u>On Time to DA</u> | <u>Late To DA</u> | <u>Total No. of Cases</u> | <u>Percent On Time</u> |
|--------------------|--------------------------|-----------------------|-------------------------------|----------------------------|
| 1973 | 167 | 24 | 191 | 87 |
| 1974 | 233 | 25 | 258 | 90 |
| 1975 | 178 | 22 | 200 | 89 |
| 1976 | 127 | 24 | 151 | 83 |
| 1977 | 116 | 21 | 137 | 85 |

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The principal factors contributing to the attainment of less than the ultimate in reply timeliness were identified as the increasing complexity of subject matter covered in audit reports, and the ultra-short DA deadlines for providing command positions on a number of GAO reports. Other factors contributing to the mediocre performance were the loss of time in the interagency action assignment process, and the lack of a sense of urgency on the part of a few DARCOM organizations when faced with the requirement to produce high quality positions within brief time periods.

(U) Throughout the fiscal year, reply timeliness was a topic for discussion with Commanders and Comptrollers during staff visits and Comptroller Evaluation Surveys at field installations and activities.

(U) Quality Improvement of DARCOM Positions on External Audit Reports. In mid-1974, the Comptroller initiated a program to improve the quality of DARCOM positions on external audit reports. Because of its potential for assisting DARCOM in achieving effective and efficient mission accomplishment, the program was approved by the Commanding General, DARCOM, and characterized as an imaginative management tool likely to provide continuing benefits at all levels of command.

(U) To implement the quality improvement program, a system was devised for rating positions, in percentage terms, against a number of critical factors. Since mid-1974, the Comptroller applied these factors in the rating of more than 600 command positions. The results of reviewing these positions were used in semiannual reports, conferences, briefings to selected offices, workshops, and in numerous person-to-person discussions with DARCOM action officers to gradually upgrade the quality of command performance.

(U) During the first six months of program execution, the average rating of a DARCOM position was 80 percent (against a possible 100 percent). Program payoff was reflected in the fact that the FY 1976 average increased to 86 percent and, in FY 1977, the command average rating moved up to 89 percent. The ultimate goal, command-wide, remained at 93 percent.

(U) Alleged DARCOM Violations - RS 3679. During FY 1977, the Comptroller continued the practice of keeping the Command Group apprised of the current status of each potential DARCOM violation of RS 3679 or administrative violation of AR 37-20.

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(U) Since inception of the RS 3679 review project in July 1976, DARCOM was involved in 24 alleged violation cases. Twelve cases were closed by the end of the fiscal year and 12 cases were in various stages of review or investigation. With regard to each of the 12 closed cases, it was noteworthy that DA review resulted in a determination that no violation occurred.

(U) Review of the 12 open cases revealed that the greatest deterrent to more rapid case closeout was the amount of time taken by DA/DOD for review of reports submitted by DARCOM in accordance with AR 37-20.

(U) AAA Advisory Report for Field Commanders - Administrative Control of Funds. Early in the fiscal year, the Army Audit Agency initiated a new concept of advisory audit reports. The new series of reports was designed to assist commanders in the field through the publication of problems of wide interest that were documented during regular audits.

(U) The advisory report on administrative control of funds, issued 1 July 1977, covered major common problems identified during FY 1976-77 audits that were performed as an integral part of the Army's Financial Management Improvement Program. Briefly, the report discussed the following major problem areas:

(U) Decentralized Fund Management. Many program/activity directors allowed fund limitations (ceilings and targets) to be exceeded because they did not fully understand the extent of informal recordkeeping required within an automated financial system environment.

(U) Recording Obligations. Obligations were often not recorded in the month in which they were incurred. This was primarily due to problems in control of document processing between the point of origin and entry into the FAO automated records, month-end transaction cutoff dates, and review and correction of exception data. Invalid obligations also resulted from overestimates, delayed adjustments, and insufficient documentation.

(U) Coordinated Reviews of Unliquidated Obligations. Invalid obligations remained in the FAO records and reports for extended periods because coordinated reviews of unliquidated obligations were not well planned and executed.

(U) Reimbursement Program. Orders received by the performing activity and obligations of the ordering activity (where the ordering activity was serviced by the same FAO) were recorded when reimbursements

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were earned instead of when the orders were accepted. Performing activities incurred costs without reimbursable orders or in excess of authorized amounts. Some customers were not notified of funds available for withdrawal upon completion of the orders. Further, billings for reimbursable services were delayed and accounts receivable were not periodically reviewed to expedite collections from customers.

(U) Reconciliation of Financial Records and Reports. Errors in the FAO records and reports remained uncorrected for extended periods because general ledger account balances and status and expenditure report data were not always reconciled each month with related financial records and reports.

(U) Indicating his concern that the Command effectively discharge its stewardship of appropriated funds and accurately report on the status of those funds, the Commanding General, DARCOM, forwarded, on 10 August 1977, copies of the advisory report to commanders of major subordinate commands. Noting that the problems reported remained of current interest to the Congress, the Department of Defense, and the Department of the Army, the letter of transmittal urged commanders' continuing attention and emphasis to help maintain DARCOM's improved posture which resulted from the financial Management Improvement Program. To facilitate maximum benefit to all concerned with effective and efficient financial management, addressees were encouraged to distribute the report to appropriate installations and activities under their command jurisdiction.

(U) DARCOM Positions on GAO Audit Reports. On 8 June 1976, the Comptroller wrote to The Inspector General (DAIG) to express concern over the frequent delays experienced when DA staff agencies tasked DARCOM for preparation of positions on GAO reports. The letter explained that available reply preparation time after receipt of the tasker in DARCOM was often so short that quality positions could not be developed and submitted to DA in a timely manner. DARCOM suggested a series of DA actions to alleviate the problem and obtain maximum value from the time available for reply preparation.

(U) By letter dated 19 November 1976, The Inspector General advised this headquarters that he shared DARCOM's concern over reply quality and timeliness and had approved and was implementing all of DARCOM's recommendations for improvement.

(U) In continuance of the mutual effort described above, DA published a revised version of Chief of Staff Regulation 36-1, US General Accounting Office Reports and Related Requirements. The principal changes required all DA staff agencies to take certain actions (all of them based on formal DARCOM recommendations).

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(U) This included the immediate review of all new GAO reports to determine whether DARCOM or any other major Army command involvement was required for preparation of the DA response. Also, agencies would promptly notify DARCOM (DRCCP-IA) by telephone of any DARCOM action assignment and confirm the assignment in writing. Finally they were to establish realistic suspense dates, and designate an official in each DA staff agency to serve as point of contact on external audit matters.

(U) GAO Report on Serious Breakdown in the Army's Financial Management Systems. One of the most important financial management reports issued by the General Accounting Office (GAO) during the fiscal year escalated details of the Army's financial management problems to the Congressional level.

(U) The report charged the Army with experiencing a serious breakdown in the financial management and control of its procurement appropriations, thus resulting in several violations of the Anti-Deficiency Act. Overobligations totaling \$205 million in three appropriations were reported to the President and the Congress. GAO noted that the Army was preparing violation reports on two additional appropriations and was investigating possible violations in eight others. The Army was credited with engaging in a comprehensive effort to correct its financial records and identify specific causes of the violations.

(U) In explaining the reasons for the reported conditions, GAO stated that the Army had not fully implemented a procurement accounting system that effectively recorded, accounted for, and reconciled financial and program data, although efforts to do so had been made. The report recognized that a massive effort was being made to solve the problems surfaced by GAO. It stated that, in the future, GAO planned to concentrate on evaluating and monitoring the implementation of corrective actions identified by the Army to prevent violations of the Anti-Deficiency Act and improve financial management in general. The GAO report received wide distribution within DARCOM and was highlighted on 4 May 1977 in the Comptroller Synopsis.

Management Review and Analysis

(U) The major thrust of Management Review and Analysis Division in FY 1977 was to provide the DARCOM Commander and Command Group with independent and objective evaluations of program performance for Materiel Development and Materiel Readiness. Activities included the development of Command Performance Indicator Review System (CPIR) for the Commanding General, and publication of a DARCOM Fact Book and DARCOM Data Book which were distributed to all staff and field elements. The staff conducted field visits and met with new installation commanders

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and comptrollers and provided technical assistance to insure that management, review and analysis and productivity improvement program were conducted at the highest professional level.

(U) Five Comptroller Evaluation Surveys conducted during the year provided commanders with independent reviews of their comptroller organizations. Also, ten Methods and Standards Program Reviews conducted during this period found that significant progress had been made in the implementation of work measurement summary level standards for managing supply and maintenance operations at depots. Progress continued on reinstating the appropriated Quick Return on Investment program in the FY 1979 budget. Other on-going programs such as the Idea Interchange, Productivity Trend and Evaluation System, Committee Management, Comptroller Career Program, and Economic Analysis Program contributed significantly to the accomplishment of the DARCOM mission in FY 1977.

(U) The Third Quarter, FY 1977 saw the approval of a study to merge the Management and Review and Analysis Division. The merger, which contemplated a closer relationship between two similar functions, was approved on a provisional basis until the results of the last DA Manpower Survey were finalized and implemented. As a part of the merger, the Economic Analysis function was transferred to the Cost Analysis Division and the Comptroller Career Program function was integrated into the Management Analysis Branch, along with the Executive Communications effort.

Command Performance Indicator Review (CPIR) System

(U) The Commanding General, DARCOM, instituted on 5 August 1977, the DARCOM Command Performance Indicator Review (CPIR) System. Under the CPIR System, Directors and Separate Staff Office Chiefs of DARCOM were to make briefings to the Commanding General covering performance in the areas of the DARCOM mission for which they were responsible. In these briefings, they presented the performance indicators they use to manage their portion of DARCOM's mission, highlighting good and poor performance and discussing those indicators where performance deviates from a norm or standard or misses a target or objective. Beginning January 1978, presentations to the Commanding General will be made quarterly. When fully implemented, it was planned that the Command Performance Indicator Reviews will serve as the Commander's management information system.

(U) The Comptroller was made responsible for organizing and managing the CPIR System including providing the staff with technical assistance on evaluation, charting, and presentation techniques and briefing format; scheduling of presentations; providing a summary at

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each briefing session; and, as appropriate, critiquing the indicators presented, preparing a Memo for Record including Directed Actions; following up on serving as the Office of Record for and publishing an official list of approved Performance Indicators. As the CPIR System evolves, a computerized data base will be established by the Comptroller to provide quick response to DARCOM Command Group needs for statistical management information.

(U) Command Management Review and Analysis (CAMERA) Briefings. In order to focus attention on or facilitate command discussions on critical situations, in-depth review and analysis studies are conducted, referred to as CAMERA briefings. During FY 1977, four briefings were presented.

(U) CAMERA NO. 1-77, presented by Mr. Koestler on 6 October 1976, reviewed the return on investment (ROI) concepts as a means of management and control of DARCOM operations. The study was also presented on 1 December 1976 to the DARCOM Comptroller's Conference at Lake of the Ozarks, Missouri. This review was also presented on 10 January 1977, in a shortened form, to Mr. James F. Maclin, Assistant Deputy for Materiel Readiness. The presentations resulted in a conclusion that the current Army Financial Accounting Systems lack discipline to serve as a basis for an ROI Command Evaluation and Control System for DARCOM. Also, data requirement shortfalls were included in a Department of Army contract for review of all Army-wide Accounting Systems.

(U) CAMERA No. 2-77, given by Mr. Broyles on 19 November 1976 to the Chief of Staff, HQ DARCOM, reviewed the Army Commercial and Industrial Type Activities (CITA) Program. This CAMERA presented findings of a study conducted by the HQ DARCOM Comptroller evaluating the degree to which DARCOM had administered the CITA Program. The thrust was to identify favorable aspects or those that could be vulnerable to criticism and required corrective action. The briefing covered findings related to the three administrative requirements in the CITA Program; e.g., the Annual Inventory Report, the Cyclic Reviews, and New Starts. The Chief of Staff accepted the conclusions and recommendations and directed that corrective actions be taken in six areas of the DARCOM CITA Program.

(U) CAMERA No. 3-77 reviewed the DARCOM Productivity Trend Evaluation System (PTES) and was presented by Mr. Lederman on 8 December 1976 to the Deputy Commanding General for Materiel Readiness, DARCOM. The CAMERA covered productivity trend data and indices derived from the Comptroller's PTES, which provided functional coverage of base operations supply, maintenance (except at ammunition depots), and central procurement (commodity commands only), as well as summary

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level data. The review included consolidated commodity command and depot productivity index performance in addition to individual command/depot indices.

(U) CAMERA No. 4-77 reviewed management operations of the DARCOM Arsenals, and was presented by Mr. Lopez on 24 January 1977 to the Deputy Commanding General for Materiel Readiness, DARCOM. The briefing outlined the results of an evaluation of DARCOM Arsenals' performance at the direction of the DARCOM Commander. The six active DARCOM Arsenals (Edgewood, Picatinny, Pine Bluff, Rock Island, Rocky Mountain and Watervliet) were included in the project. Results of review included ten directed actions by the DCGMR with two of the more significant being: that the programming, funding, and reporting of the Depot Supply Operations Program at Pine Bluff and Rock Island Arsenals be made part of DARCOM Depot System under DESCOM, and that a Cost/Schedule Control System (CSCS) be implemented at Watervliet, Rock Island, Picatinny and Pine Bluff Arsenals.

(U) Comptroller Evaluation Surveys (CES). The Comptroller Evaluation Survey Program was continued during FY 1977 with visits to five major subordinate commands. The initial survey of NARADCOM and MERADCOM in their elevated status to MSC's proved both commands were operating efficiently. The visits continued to provide the commanders with an independent evaluation of their Comptroller operations with recommendations for improvements. Also, the command had an opportunity to present HQ DARCOM with problems which required headquarters action. The results of the surveys proved helpful by resolving problems and improving the execution of Comptroller functions. These commands continued to be scheduled for survey after a sufficient period of operations to assist them in their formation and provide an early evaluation to insure that all functions were operating properly.

(U) DARCOM Methods and Standards (M&S) Program Reviews. During FY 1977, a total of ten Methods and Standards (M&S) Program Reviews were conducted throughout Depot and major subordinate commands. DARCOM Methods and Standard reviews were scheduled every two years or more frequently based on problems being encountered by DARCOM installations. Emphasis during the reviews was on the administration of the M&S Program and the validity, application and utilization of work measurement data for managing resources. During the on-site reviews, specific guidance was provided for the improvement of program administration and better utilization of data.

(U) Management Study of DCGMD Organization. A management study of the DCGMD organization began on 2 May 1977. The objective of the study was to determine how well the objectives of the Study to Align AMC's Functions (STAAF), also known as the Sears' Study, had been

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carried out in the Deputy Commanding General for Materiel Development (DCGMD) area of operations; and to make recommendations regarding what had to be done to achieve those objectives not yet met. The study also was charged with obtaining higher headquarters and the fields' reaction to the reorganization of HQ DARCOM.

(U) The objectives examined by the study were to: (1) develop a new way of doing business; (2) organize a smaller hard-hitting "corporate-type" headquarters; (3) maximize decentralization by transferring functions to the field; (4) accommodate management of logistics commands and development centers; (5) retain the capability to manage resources, develop program and policy and evaluate performance; (6) use word processing centers and; (7) install a two-way air request net (2-WARN) communications philosophy.

(U) In general, the objective of a smaller headquarters was met. Under the assumption that the other objectives were still valid, the study offered 16 recommendations designed to carry them out. Field and HQDA (DCSRDA) reactions along with the reaction of the DCGMD staff were also obtained.

(U) Results of the study were briefed, 21 September 1977, to the DCGMD (General Baer) and to the DCGMD staff principals on 23 September 1977. Subsequently, General Baer discussed the study findings and recommendations with the DARCOM Commanding General.

(U) Monthly Financial Update. In April 1977, responsibility for preparing the Monthly Financial Update for the Comptroller and Command Group was transferred from the Finance and Accounting Division to Management Review and Analysis Division. A Hewlett Packard Programmable Calculator was utilized to compute and graphically plot the data each month after input was provided by the Finance and Accounting Division and respective program directors. The status of APA, RDTEA, OMA and Stock Fund Obligations was provided the Command Group. Effective with FY 1978, a new procedure will be implemented which will keep most of the background data at the Comptroller Directorate level. Only those items where there were problems or potential problems were to be forwarded to the Command Group.

(U) DARCOM Comptroller's Conference. The annual DARCOM Comptroller's Conference was held during the period 20 November - 3 December 1976. It was divided into two segments, the first, 30 November - 1 December for the MSC Comptrollers, and the second 2-3 December for Depot Comptrollers. In a significant departure from previous years, the conference was held at the Lake of the Ozarks, Missouri, in order to improve the climate for the interchange of ideas and reduce travel requirements for those Comptrollers located in that area. The theme of the conference

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was "The Financial Management Improvement Program" and the principal Address was presented by the Honorable Hadlai A. Hull, the Assistant Secretary of the Army (Financial Management). Overall, it was the unanimous opinion of the attendees that it was one of the most successful conferences ever held.

(U) Productivity Measurement and Evaluation. DARCOM continued to upgrade the system to measure and evaluate its productivity internally as required by AR 5-4, Department of the Army Productivity Improvement Program. The Productivity Trend and Evaluation System (PTES), as applied to DARCOM Depots and Readiness MSC's, was an indication of an activity's utilization of resources compared with a previous period of time. PTES was used to identify problem areas and to assist Commanders/Managers in the allocation of resources.

(U) Quick Return on Investment Program (QRIP). The appropriated QRIP budget was eliminated for FY 1978 by Congress. OSD's efforts to reinstate funding in the FY 1979 budget were actively supported by this office in FY 1977. DARCOM submitted recommended changes in the structuring of accounts and corresponding changes in the allocation of them. The changes considered by DACA-MP which would have increased the flexibility of the program and could have substantially enhanced the funds were eliminated. The fast payback system will continue at AIF installations.

(U) Idea Interchange. The purpose of the DARCOM Idea Interchange Program was to maximize the benefits to be gained from useful ideas developed in one activity; i.e., ways to accomplish the mission cheaper, faster and/or better by making these ideas available to other DARCOM activities. This was accomplished through a quarterly publication. Both DOD and DA expressed an interest in the publication and requested to be placed on distribution.

(U) Equal Employment Opportunity Program. EEO progress was made toward achieving the employment situations outlined in the Headquarters DARCOM FY 1977-78 Equal Employment Opportunity Plan of Action. Accomplishments relating to the more significant situations were reported, with emphasis on the status of the Comptroller work force, in the Comptroller's semi-annual report of the headquarters EEO Office. Closing the grade gap between male and female employees and non-minority and minority employees showed a slight improvement despite a declining workforce.

(U) Comptroller Career Program. The new Army-wide Comptroller Career Appraisal and its associated referral system became operational during the past year. Major commands throughout Army conducted screening

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panels to evaluate their own careerists and recommended referral levels for each individual submitting an appraisal. These recommendations were then considered by the DA screening panels, where final referral categories were established. DARCOM, as well as other commands, was represented at DA by panelists who had participated in their parent command's screening activities. Referral rosters were developed for each of the Comptrollers specialties based on the referral categories assigned by the DA panels. These rosters were the source of candidates placed on Army-wide referral lists for career program position vacancies.

(U) Committee Management. An inventory of DARCOM Committees was completed and a revised DARCOM Supplement 1 to AR 15-1, Committee Management published. The DARCOM Junior Science and Humanities Symposia Advisory Committee did not receive OMB concurrence in its continuation and was terminated during the year. The most significant action was working with Chemical Systems Laboratory, Edgewood, to establish a Human Use Advisory Committee to review and approve plans for tests which used humans as subjects.

Directorate for Installations and Services

Mission and Organization

(U) The mission of the Directorate for Installations and Services was to direct, supervise, and develop the authorization and funding program for, and/or coordinate the management and utilization of, the physical plant of the US Army Materiel Development and Readiness Command the logistical support services incident to the operation of its installations, to include: construction; utility operations, repair and maintenance of facilities; functional aspects of information system design, development, training, implementation, and operation; environmental protection involving air, water, noise, and all other forms of pollution; conservation of energy and natural resources; land management; fire prevention and protection; real estate; family housing, housing referral service, guest houses, barracks, and bachelor quarters; intraservice and interservice support agreements (excluding wholesale supply support agreements); audio-visual activities; direct and general support maintenance, authorization, utilization, and redistribution of installation equipment, industrial plant equipment, and administration transport vehicles, utility railroad equipment, and marine floating equipment; retail supply activities, clothing sales stores, and self-service supply centers; commissaries, post exchanges, theaters, post restaurants, open messes, and commercial-industrial type activities. Also, it directs Energy Coordination Center activities. In general, the DARCOM Director of Installations and Services served as Resource

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Manager and Program Director for the Military Construction, Army (MCA) Appropriation, and Program Director for the DARCOM Installations and Services Program, as the Resource Manager and Program Director for the DARCOM Family Housing Management Appropriation (Budget Programs 1800 and 1900), and directed the operation of the DARCOM Installations and Services Activity (ISA) at Rock Island Arsenal.

(U) This Directorate included a Plans and Programs Office, and three functional divisions: Services, Engineer, and Housing Management.

Real Estate

(U) During the reporting period, the Military Installations and Facilities Sub-Committee of Congress approved the following major real estate actions:

(U) Frankford Arsenal, Philadelphia, Pennsylvania.⁶¹ Congress approved the disposal of the Arsenal which was established 27 May 1816 and consist of approximately 110 acres and various buildings and structures. The entire Arsenal was listed in the National Register of Historic Places; therefore, disposal procedures had to be in accordance with applicable laws and regulations. Missions have been transferred to other installations.

(U) Situated on the Delaware River, in northeast Philadelphia, its mission was to research, develop, design, engineer, procure, manage, and supply small arms and fire control materiel in support of the United States Army Armament Command (ARMCOM). Pursuant to the 22 November 1974 decision of the Secretary of Defense to close Frankford Arsenal, its principal functions were transferred to other ARRCOM installations. The City of Philadelphia expressed an interest in acquiring the property.

(U) Pueblo Depot Activity, Pueblo, Colorado.⁶² Congress approved the Department of the Army's request to offer for lease three buildings located in the warehouse area of the Depot. The buildings have been advertised for lease to private industry. By leasing the buildings, the Government will reduce maintenance and utility costs and conversion from semi-active to active status in the event that mobilization can be readily accomplished.

(U) The primary mission of the Pueblo Depot Activity, a semi-active installation, was to operate a reserve storage-maintenance activity under the command of the Tooele Army Depot, Tooele, Utah.

⁶¹Department of the Army Real Estate Disposal Report No. 607, 30 Jun 77.

⁶²Department of the Army Real Estate Disposal Report No. 601, 31 May 77.

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Reduced missions and consolidation of activities as a result of Project CONCISE vacated three permanent-type industrial buildings.

(U) Badger Army Ammunition Plan, Baraboo, Wisconsin.⁶³ Congress approved the Department of the Army's request to offer for lease the Nitrocellulose Production Line "E," acid unloading and mixing facilities and portions of the Army Ammunition Plant to the Olin Corporation for commercial purposes. By leasing the property, the Government will reduce its maintenance and utility costs for the facility.

(U) Single Manager for Conventional Ammunition. As a result of the Secretary of Defense's directive designating the Secretary of the Army as single manager for procurement, production, supply, and maintenance/renovation of conventional ammunition within the Department of Defense, with the approval of Congress, these two installations were transferred to the Department of the Army effective 1 October 1977.⁶⁴ In order to accomplish this mission, the Department of the Army will also have the use of United States Naval Weapons Support Center, Crane, Ohio; however, jurisdiction of this installation will remain with the Department of the Navy.

(U) The objective of the single manager concept was to achieve the highest possible degree of efficiency and effectiveness in the DOD operations required to provide top-quality conventional ammunition to U.S. Forces during peacetime and mobilization. The implementation plan for the single manager was designed with two phases. A transition of procurement, production, maintenance, storage and inventory management functions to the single manager will be accomplished under Phase I. Under Phase II, the responsibilities of the single manager will be expanded.

(U) Lima Army Modification Center (LAMC).⁶⁵ As a result of a land survey made under Executive Order 11953, "Providing for the Identification of Unneeded Federal Property," approximately 163 acres of land at LAMC were declared excess and conveyed to the Johnny Appleseed Metropolitan Park District (JAMPD) of Allen County, Ohio for use as a park. On 6 August 1976, the Secretary of the Army announced the selection of LAMC as the production site for the XM-1 Main Battle

⁶³Department of the Army Real Estate Disposal Report No. 606, 31 May 77.

⁶⁴Department of the Army Real Estate Acquisition Reports No. 318 and 319, 31 Aug 77.

⁶⁵1st Ind (DRCIS-ER), 6 May 77, Subj: Revestment of Title to Lima Army Modification Center Land in Support of XM-1 Tank Production, w/basic ltr (STAMC-CO), 18 Apr 77.

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Tank. The reactivation plans for the Center precipitated a need for approximately 86 acres of the property previously conveyed to the Park District. The acreage which is required for the tank testing track is being reacquired through revestment authority contained in the original deed conveying the property.

(U) The Johnny Appleseed Metropolitan Park District requested reimbursement of approximately \$7,200 for costs incurred in acquiring and developing the portions of property reclaimed. This property was being reclaimed for an indefinite period exceeding 15 years.

(U) Planned construction of the new test track at the Lima Army Modification Center was scheduled to begin in late 1977 and was to cost approximately \$1.8 million. Consistent with the mobilization expansion requirements, this track was to be located so that future expansion could be accomplished without a relocation of the test track with the attendant expenses and insult to operations.

(U) Blossom Point Test Site.⁶⁶ A condemnation leasehold was filed in the US District Court covering the use of 1,440 acres of land by Department of the Army (Harry Diamond Laboratories). Annual rental will be \$133,000. It was necessary to lease the land until such time as funds became available for the purchase of the land.

(U) AVSCOM/TROSCOM. Case Study and Justification Study No. 327, dated 19 April 1976, provided for certain realignment actions. As a result of the realignment and proposed move of personnel from the Federal Building (formerly Mart Building) to the Federal Center in St. Louis, Missouri, it was necessary to renovate Building 103 and a portion of Building 105. Construction of an ADP facility and a Communications Center was also necessary. Details involving the construction and move were coordinated with the District Engineer and regional General Services Administration.

(U) Historical/Archeological Data. Many actions relating to Executive Order 11593, "Protection and Enhancement of the Cultural Environment," were processed during this time period. The Executive Order pertained to the preservation, restoration, and maintenance of historical and cultural sites, buildings, structures, objects, and districts. This past year a great deal of emphasis has been placed on the archeological aspects of the Executive Order. This command has approximately 4½ million acres of land under its jurisdiction. Our goal, as manpower and money become available, is to have all of these

⁶⁶Msg (DRCIS-ER) 131805Z Apr 77, to Dist Engr, Baltimore, Subj: Leasehold Condemnation, Blossom Point.

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lands surveyed for possible archeological sites which may be eligible for nomination to the National Register of Historic Places. In the meantime, any areas where land disturbance is planned, such as construction, and tank maneuvers, must be surveyed for archeological sites in accordance with existing regulations.

DARCOM Energy Program

(U) DARCOM met the Department of the Army goal of no increase in consumption over FY 1975 (revised).⁶⁷ Consumption was 22 percent below the FY 1975 base. In addition, DARCOM met its self-imposed goal of a three percent reduction compared to the previous year's consumption with a four percent reduction overall. Natural gas decreased 34 percent and coal 12 percent; but diesel fuel increased 25 percent and petroleum heating fuel 17 percent compared to the previous year.

(U) Over 80 percent of the installations visited by a team from the Installations and Services Activity during FY 1977 had energy programs that were evaluated adequate or better. The most frequent deficiencies included disregard of lighting and heating standards, heating and cooling of excess areas, excessive steam leaks and excessive transformer capacity.

(U) The ride-sharing ratio (total work force per average number of vehicles commuting) improved from 1.53 in March 1977 to 2.16 in September 1977 for an average of 1.78. Personnel at Aberdeen Proving Ground established DARCOM's first van pooling program with the creation of the Upper Chesapeake Vanpool Corporation. Actual van pooling was to begin in February 1978 when the drivers are licensed.

(U) A three percent increase in efficiency of energy utilization compared to the FY 1977 consumption is one of the goals for FY 1978. Another is a five percent increase in the ride-sharing ratio compared to the average ratio for FY 1977.

Minor Construction

(U) Urgent minor construction projects and self-amortizing minor construction projects (\$75,000-\$400,000) funded for construction for DARCOM installations or activities amounted to \$5,097,380. Forty-two projects were received during the fiscal year.

PBS Project Activity

(U) By the end of fiscal year 1977, \$83.9 million in Production Base Support Construction Projects were awarded. This represents 101.3 percent of the \$82.8 million construction that had been forecast for award. For the prior year construction programs (FY 1971-76), \$347.5 million or 89.3 percent were awarded. All construction projects prior to FY 1971 were awarded.

⁶⁷ DRCIS-EE, Fact Sheet, Subj: DARCOM Energy Program, which summarized the program for FY 1977.

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Production Base Support Program

(U) During FY 1977, quarterly Production Base Support Interface meetings were held at various installations to keep abreast of significant actions, although the shortage of travel funds limited the number of meetings. Attending the meetings were representatives of the Office, Chief of Engineers; the Office, Deputy Chief of Staff for Research, Development, and Acquisition; US Army Materiel Development and Readiness Command; DARCOM's major subordinate command headquarters; and the Project Manager for Munitions Production Base Modernization and Expansion. Facility Working Group meetings, first held during FY 1973 but reaching full implementation during FY 1974, were beneficial in improving local level coordination between the ammunition plants and the engineer districts.

(U) While money for many Mod/Expansion and Production Support and Equipment Replacement (PS&ER) projects had become increasingly tight, funding was assured for the controversial project at Mississippi AAP. With a view toward increased Congressional control and visibility, the House Appropriations Committee expressed a desire to have all final designs completed by the time the Army's Appropriation Request was submitted to Congress, effective with the FY 1977 program. Beginning with the FY 1977 budget program, procurement-funded construction had to be authorized by the Armed Services Committees as well as being approved by the Appropriations Committees.

Design and Construction Surveillance

(U) The Installations and Services Activity, during the 15 month period from 1 July 1976 to 30 October 1977, continued to emphasize the optimum use of available resources and a greater responsiveness within the major construction programs of the US Army Materiel Development and Readiness Command (DARCOM). A goal of earlier and more fundamental Activity involvement in project planning and documentation has been pursued to the greatest extent possible.

(U) A significant achievement during the last year was the Activity participation in the evaluation of major PBS construction at privately owned commercial sites. Specifically, technical assistance was offered at Chamberlain Corporation at Waterloo, Iowa; National Presto at Eau Claire, Wisconsin; and Callery Chemical Company at Callery, Pennsylvania. The notable point was that these visits and reviews were conducted upon request since AR 700-90 did not require I&SA participation in projects at commercial sites.

(U) A routine of on-site project evaluations for the MCA Program was being implemented as funding and workload permitted. The intent was to review the short and intermediate range MCA Programs at each installation every two years. At the present time, the procedure of including on-site MCA review during Combined Staff Visits was to be continued. The ultimate goal was to routinely evaluate the entire MCA Program on a biennial schedule. This was to allow more fundamental involvement in the MCA Program, and yield fewer project complications and more adequate design criteria.

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(U) An orderly procedure for the coordinated review of complex projects was being worked out, and was in the early stages of implementation. The goal of the coordinated review procedure was to insure that appropriate staff specialists outside of I&SA perform necessary evaluations of specialized portions of construction projects. Examples of specialities involved were safety, security, environmental hygiene, communications, and audio-visual support equipment.

(U) In keeping with the DARCOM philosophy of standardization of similar facilities, the Activity played a leading role in the two major areas of incinerators and containerization projects. In the MCA Program, progress was made in the standardization of incinerators for both explosive waste and explosive contaminated waste. Similarly, in the PBS program, the Activity provided technical guidance toward standardization of containerization projects at the ammunition plants. A third area with potential in future months was the implementation of total energy studies at selected ammunition plants undergoing modernization.

(U) The transfer of Stratford Army Engine Plant to DARCOM from the Air Force imposed a substantial requirement for technical assistance upon the Activity. TSARCOM required extensive support, since Stratford was their first GOCO and were unfamiliar with PBS construction programming and project development. The need for substantial Activity assistance was compounded by a \$20 million program of upgrading facilities to Army standards.

(U) The Construction Engineering Branch lost its system of project status reporting when ARRCOM changed the computer system which had supported it. Additionally, the Construction Engineering Branch technician, who had maintained the construction surveillance status report, was transferred and lost from the TDA. The result was that the Construction Engineering Branch lost its comprehensive project status reporting capability. January 1978 was the new target date for the new computer system, which will allow access by authorized organizations.

Summary of Activities

(U) The design criteria for 253 MCA and Production Base Support (PBS) programmed projects estimated to cost \$1,096,994,000 were reviewed and six projects estimated to cost \$6,515,000 were on hand.

(U) Concept design for 126 MCA and PBS programmed projects estimated to cost \$494,279,000 were reviewed. Seven projects estimated to cost \$76,304,000 were on hand.

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(U) The final design for 54 MCA and PBS programmed projects estimated to cost \$128,442,000 were reviewed. Three projects estimated to cost \$4,041,000 were on hand.

(U) Two hundred and forty six man-visits were made in FY 197T and FY 1977.

(U) Benefits from actions taken came from office and on-site review of projects in FY 197T and FY 1977 which resulted in an estimated cost avoidance of \$40,611,000. Also, office and on-site review of projects in FY 197T and FY 1977 resulted in recommendations and actions pending with potential cost avoidance of \$3,391,000.

Master Planning

(U) Nonreimbursable Master Planning Assistance Funds. In order to provide up-to-date master plans, HQDA, through the Corps of Engineers, has made funds available to the District Engineer offices that support DARCOM installations. These funds are for Phases II, III, and IV (AR 210-23, Master Planning for Emergency Expansion Capability) of Master Planning. The amounts allocated were as follows:

| | <u>Programmed</u> | <u>Obligated</u> |
|---------|-------------------|------------------|
| FY 1976 | 420,000 | 420,000 |
| FY 197T | 608,700 | 608,700 |
| FY 1977 | 534,000 | *460,000 |
| FY 1978 | 2,056,000 | - |
| FY 1979 | 1,240,000 | - |

*as of 1 July 1977

(U) Master Planning for Army Ammunition Plants. A late start project was initiated in FY 1977 for Master Planning at Sunflower Army Ammunition Plant. On 9 September 1977, \$823,592 of Production Base Support (PBS) funds were allocated for the Sunflower Project. Huntsville Division of Corps of Engineers (COE) was assigned the responsibilities for master planning for all Army Ammunition Plants (AAP) which were Government-owned, Contractor-operation (GOCO) and will develop the criteria for master planning for GOCO's.

(U) Funds for master planning at Badger and Radford Army ammunition plants were budgetted in FY 1978, but at this writing, it appears that sufficient funds will be available for Badger AAP only in FY 1978.

(U) ARRCOM budgeted \$3,000,000 for master planning in FY 1979 but the entire amount was deleted on 12 July 1977 at the DA/DARCOM budget hearings.

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Air and Water Pollution Abatement Program

(U) From 1966 to 1978, the DARCOM Military Construction, Army (MCA) pollution abatement program authorized and funded by the Congress amounted to \$206 million, of which \$76 million was for air and \$130 million was for water.

(U) For FY 1979, Congress was examining a program which contained \$16 million for air and \$29 million for water projects for a total of \$45 million.

(U) DARCOM proposed an MCA pollution program for FY 1980 totaling \$37 million, of which \$9 million was for air and \$28 million was for water.

(U) The revised MCA air and water pollution abatement program for fixed facilities at the close of FY 1977 follows:

| | | | |
|--|-----------------------|---------------------|---------------|
| FY 1966-75 | Authorized and Funded | Air (57 projects) | \$61,773,000 |
| | | Water (94 projects) | 78,300,000 |
| FY 1976 | Authorized and Funded | Air (4 projects) | 2,647,000 |
| | | Water (15 projects) | 23,707,000 |
| FY 1977 | Authorized and Funded | Air (2 projects) | 11,228,000 |
| | | Water (4 projects) | 22,741,000 |
| FY 1978 | Authorized and Funded | Air (1 project) | 474,000 |
| | | Water (5 projects) | 6,535,000 |
| FY 1979 | Submitted to OSD/OMB | Air (15 projects) | 16,505,000 |
| | | Water (1 project) | 29,000,000 |
| FY 1980 | Proposed by DARCOM | Air (8 projects) | 8,991,000 |
| | | Water (11 projects) | 27,652,000 |
| Total Air Pollution Projects: 87 | | | \$101,618,000 |
| Total Water Pollution Projects: 130 | | | \$187,935,000 |
| Grand total of Air and Water Pollution Projects: 217 | | | \$289,553,000 |

Housing Management

(U) Program Review. Initial staff reviews were completed at all DARCOM installations early in FY 1977. Approximately 70 percent of the installations received a rating of adequate or above. Follow-on reviews were conducted during FY 1977 and were expected to be completed by December 1977 with results indicating better than 90 percent of all installations receiving an adequate or better rating.

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(U) Construction of Family Housing Units. Forty new townhouse type family housing units were being constructed at Tobyhanna Army Depot with completion expected late in CY 1977. Construction of the roads was one of the items which delayed final acceptance.

(U) Substandard Housing. HQDA was conducting a study of all sub-standard family housing within the Army. Three alternatives were being reviewed which included: disposal; retain in an "as is" condition for balance of livability period; and upgrade within Congressional limitations those quarters where a bonafide requirement existed.

(U) New Construction Requirements. Three DARCOM installations had a housing deficit and either had requested or were requesting new construction. The installations were St. Louis Support Activity (TSARCOM), Red River Army Depot, and Picatinny Arsenal (ARRADCOM). It was expected that these requests would be considered in the FY 1979 program

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CHAPTER III

MATERIEL READINESS PLANS, DOCTRINE AND SYSTEMS*

Organization and Mission

(U) The Directorate for Plans, Doctrine and Systems was organized in April 1976 under the Deputy Commanding General for Materiel Readiness (DCGMR). Its mission was to act as the principal logistic planner for the DARCOM Deputy Commanding General for Materiel Readiness (DCGMR); to provide policy and guidance covering logistic support plans, concepts, doctrine, and systems; and to develop wholesale logistic doctrine and automated systems which interfaced with the Army-in-the-field and other wholesale systems.

(U) DOD Materiel Distribution Systems (DODMDS) had the mission to review military service and Defense Logistics Agency (DLA) materiel distribution systems and recommend alternatives to integrate, consolidate, and standardize functions and facilities.

(U) The mission of the Associate Director for Plans and Doctrine was to provide policy and guidance for the DCGMR in support of contingency mobilization and emergency plans; to provide support for general mobilization requirements and stockage levels to include CONUS and oversea war reserves, operational projects, and contingency stocks; to develop logistic support plans pertaining to supply, maintenance, transportation, services, and facilities, and to initiate improved techniques to incorporate doctrine in logistics manuals and into Army school curricula.

(U) The mission of the Associate Director for Systems was to develop improved automated logistics systems in the areas of supply, maintenance, transportation, services and facilities; to establish policy, provide guidance and direction for Military Standard Systems less the Military Supply and Transportation Evaluation Procedures (MILSTEP); to direct, control and evaluate functional systems requirements for new or major changes to existing DARCOM ADP wholesale logistics systems, and assure proper interface and compatibility with other wholesale and Army-in-the-field ADP logistic support systems; to maintain liaison with higher and lateral logistics headquarters in order to keep abreast of their logistics systems development; and to provide the DARCOM focal point for the management of the Standard Integrated Support Management System (SISMS) and Integrated Weapons Support Management (IWSM).

*This chapter was prepared by the HQ DARCOM Directorate for Plans, Doctrine and Systems

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Major Mission Program Activities

Planning Army Depot Maintenance

(U) A review was made of DARCOM participation in the Army Planning, Programming and Budgeting System (PPBS) for depot maintenance. The review revealed that DARCOM should continue the current procedures for submitting gross depot maintenance requirements and that increased emphasis should be placed on DARCOM participation in the early development of PPBS documents. These documents included the Army Capabilities Plan, the Preliminary Army Planning and Programming Guidance Memorandum, and Program Budget Guidance. As a result of this review, wider distribution of PPBS documents was being made within HQ DARCOM.

Depot Maintenance Programming Policies

(U) As a result of a joint OSD and each military department's efforts, concepts, criteria, and policy governing the establishment and use of a mechanized depot maintenance programming system were established. Each DOD component performing depot maintenance will establish a depot maintenance programming system consistent with the new programming policies. Most of the programming requirements had been implemented within DARCOM. The major area that remained to be implemented was the adoption of the Uniform Depot Maintenance Production Shop Categories.

Depot Maintenance Mobilization Planning

(U) Review of the DARCOM mobilization planning as it related to depot maintenance mobilization revealed that there was not sufficient detail to insure the development of total depot maintenance mobilization requirements. The plan was revised in coordination with the MRC's and DESCOM to include the requirement for integrated contact maintenance teams from the depots to assist deploying units and to improve guidance for predicting the materiel repair requirements. Implementation during the 1978 planning cycle was expected to make DARCOM more responsive to the total Army maintenance needs during mobilization and provide justification for existing depot maintenance capacity.

Direct Logistics Support

(U) A new innovation in logistics is the Direct Logistic Support (DLS) system which was designed to improve logistic assistance to Commanders at all levels. When implemented, Commanders would have a single technical source from which to obtain assistance for

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problems in maintenance, supply, personnel, training, doctrine, and funding. The Direct Logistic Support Concept fulfilled the need to provide assistance in areas other than maintenance and supply if units were to achieve and maintain a high state of readiness.

(U) Procedures for coordination of technical assistance already existed in one form or another but were dependent upon local operating relationships which changed when personnel rotated. Direct Logistic Support would formalize technical assistance procedures to provide a single point at Division, Corps and MACOM level for coordination with the Command and Staff. DARCOM Logistic Assistance Activities (DLAA) would be collocated with the Divisions, Corps and MACOM's to provide technical assistance to the Commanders at all levels in coordination with DS/GS units, Maintenance Assistance & Instruction Team (MAIT) and Materiel Management Centers. In addition, DLS would permit more timely interchange of that technical information which was necessary to improve technical assistance to the Commander and his staff.

(U) The Director of Plans, Doctrine and Systems provided membership to the DLS Study Group meetings and staffed the completed Study within DARCOM. After development and refinement of DLS procedures, the project was transferred to the Directorate for Readiness for implementation. Prior to full scale implementation, an evaluation of the concept was conducted at Fort Hood, Texas, from 1 March through 31 August 1977. The 1st Cavalry Division, DLAA and the 2d Armor Division, DLAA were established to support their organic units. All other non-divisional units at Fort Hood were supported by the III Corps, DLAA.

(U) During the period 22 February-4 March 1977, a representative of the Associate Director of Plans and Doctrine visited the Materiel Readiness Commands (MRC) and briefed the Commanders on Restructured General Support (RGS) which was a concept to establish the doctrine and organizational structure required to provide combat oriented general support on a systems/commodity basis for conventional materiel. Also, RGS determined the optimum mix of maintenance and supply functions, and the resources required to provide general support on a weapons system/commodity basis. Another representative participated in the development and evaluation of the Direct Logistics Support (DLS) System.

Status of War Reserves

(U) Prior to FY 1976 very little emphasis was placed on the management of the War Reserve Program by the DA staff; consequently, only limited funds were provided. An OSD Memorandum of 2 August 1976 referred to the concern of the Senate Appropriations Committee (SAC)

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that adequate budget backup data was not being provided to justify DOD stock fund war reserve funding requests. This memorandum initiated actions at the DA staff level for increasing the funds to meet war reserve requirements.

(U) To support the DOD and SAC requirement, major Army commands and DARCOM Materiel Readiness Commands (MRC) were requested to provide shopping lists of their most urgent requirements to the extent of their prorated obligation authority for FY 1977. In addition, the MRC's were requested to furnish a complete list of stock fund and Procurement Appropriation (PA) secondary item deficiencies for pre-positioned war reserve materiel requirements.

(U) FY 1977 was the first year that Army received a stock fund appropriation for war reserves. The \$149 million allocated to the Army was distributed as follows: DARCOM \$75.4 million; FORSCOM \$8.8 million, USAREUR \$63.2 million; and EUSA \$1.7 million. In FY 1978 it was anticipated that DARCOM would receive \$92.9 million out of a total Army allocation of \$100 million.

(U) The FY 1979-1983 POM indicated the buyout of all deficiencies of prepositioned war reserve materiel requirements for all classes of supply by the FY 1983 funded delivery period.

Phase II Study - Logistic Operations in the Communications Zone

(U) A DA, DCSLOG sponsored study group which was composed of four DA, DCSLOG members and major command representatives from TRADOC, USAREUR, and DARCOM became operational on 4 January 1977. MG(Ret) J. Pieklik served as consultant. The purpose of the study was to ensure that U.S. doctrine adequately supported the operational needs of the COMMZ logistic organizations operating in the NATO European environment, to identify and recommend changes which ensured logistic capability to meet wartime requirements, and identify voids in both doctrine and procedures.

(U) Initial effort was devoted to identifying and refining approximately 33 separate objectives and 13 individual essential elements of analysis. These were reduced to six main issues and 22 concepts. The main issues are as follows: Size, composition and structure of the GS base in the Corps; Size, composition and structure of the GS base in the COMMZ; Management of war reserves; Wholesale system's role in COMMZ; Theater Commander's role in a multi-national environment; and Type of logistics support to be provided by host nation.

(U) On 25 July 1977, the VCSA approved in principle, 18 of the 22 proposed concepts for detailed staffing and resource determination.

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The four concepts not approved concerned changes in general support maintenance operations in the Corps area and the COMMZ which will be addressed by TRADOC. TRADOC was presently conducting a test and evaluation of general support supply and maintenance under the restructured general support (RGS) concept and was expected to present a recommended general support maintenance concept on/about 30 April 1978.

(U) An in-depth study will be required to determine the impact and feasibility of DARCOM assuming new functions as a result of the study recommendations. The study would have to examine such items as the DARCOM structure, organization, personnel complement (military and civilian), potential DARCOM locations in Europe, and Command relationships. In essence, DARCOM must determine what would have to be done during peacetime to be ready to assume the general support maintenance function in war.

DARCOM Readiness Evaluation System (DRES)

(U) In May 1976, the DCGMR became concerned over the lack of any intelligence system that could be used to evaluate DARCOM's readiness from the standpoint of resources required to perform our mission in both peacetime and under mobilization conditions.

Accordingly, efforts were undertaken to develop a means for evaluating DARCOM's readiness. A concept was approved on 11 November 1976 and a high-level steering group was established at HQ DARCOM to oversee the development and implementation of a readiness reporting system. The concept for evaluating and reporting DARCOM subcommand readiness involved the assembling of data relating to the selected resource indicators, and the analysis and impact evaluation of the data to establish a readiness condition for each indicator based on predetermined parameters and standards. This readiness report was to be required on a semi-annual basis. However, there was a provision for "out of cycle" reporting if a Commander felt that his Command's mission readiness had changed to the extent that it should be brought to the attention of the CG, DARCOM, prior to the next scheduled report.

(U) The report utilized the same type narrative readiness condition indicators as contained in the AR 220-1 Unit Readiness Reporting System; i.e., REDCON-1, REDCON-2, and REDCON-3 to indicate the various readiness conditions of each of the indicators which were being reported (all indicators are not applicable to all Commands). After analyzing the status of each indicator, the commander made a subjective evaluation of his Command's over-all readiness posture.

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(U) The recently established Depot Systems Command will receive the reports from the DARCOM depots and prepare a summary evaluation of the total depot readiness posture for submission to HQ DARCOM. Also, the Materiel Readiness Commands will submit a roll-up of their respective subcommands to HQ DARCOM. In turn, headquarters staff was to prepare an over-all DARCOM Readiness Evaluation for use by the Command Group in evaluating command-wide readiness conditions, trends, and identifying readiness problems. When implemented, DRES was expected to provide a more substantive means to articulate short falls and for supporting resource requirements. DARCOM Regulation 700-14 would implement this system.

Logistics Systems Integration and Control

(U) During the first part of the fiscal year, a System Control and Coordination concept was developed, staffed and formalized in DARCOM Regulation 15-22. The regulation established the Functional Coordinating Group for Logistics Management System (FCG for LMS), chaired by the Associate Director for Systems, and consisting of representatives from all DCGMR Directorates, the Office of the Comptroller, Directorate for Plans and Analysis, and Management Information Systems. The first meeting of the FCG for LMS was conducted on 3 May 1977. During this and a subsequent meeting, a concept for developing a DCGMR plan for systems development was created. The concept was not implemented since that function was assumed by the Logistics Systems Review Committee. In June 1977, a plan to conduct executive level in-process review (IPR) for the Commodity Command Standard System (CCSS) Releases was formulated. The first of these reviews was conducted on 7 and 8 July 1977 at TSARCOM. Attended by executives from concerned DARCOM Directorates and all MRC's, the reviews were chaired by the Assistant Deputy for Materiel Readiness. The participants at that IPR agreed that the process should continue. Consequently, IPR's for the next CCSS release were conducted on 16 and 17 August 1978, and 8 September 1978. At these IPR's, the review body agreed that a DARCOM Regulation to formalize CCSS management was necessary. The Directorate for Plans, Doctrine, and Systems was charged with drafting that regulation charter, the Logistics Systems Review Committee (LSRC). In addition to reviewing CCSS releases, the LSRC also began an effort to establish a system master plan for CCSS. The task of administering the planning effort was assigned to The Directorate for Plans, Doctrine, and Systems at the September IPR.

Major Items Management Systems

(U) The Functional Coordinating Group for Major Items Management Systems (FCG-MIMS) continued to oversee the changes and new system developments of MIMS. Projects monitored by the FCG-MIMS are discussed below.

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(U) MIMS Training. Associate Director for Systems and ALMC were in the process of developing a new training course entitled "Major Items Management," which will be directed towards the major item manager at the MRC.

(U) Bridging Systems. During FY 1977, the Associate Director for Systems was in the process of identifying bridging systems for MIMS used by the MRC's. This project was expected to standardize selected bridging systems and include them as part of the Commodity Command Standard System (CCSS).

(U) Total Army Readiness/Sustainability (TLR/S). TLR/S was a DA directed system development which was to identify the readiness and ability to sustain the Army in event of war. All classes of supply were addressed by this system which had become semi-automated. In FY 1977, the Associate Director for Systems was the DARCOM Office of Primary Responsibility (OPR) for development. Data was collected, processed, and provided to DA for all RICC I items. ALMSA had been tasked to expand/automate the secondary and stock fund item data required for input to TLR/S.

(U) Total Army Equipment Distribution Program (TAEDP). TAEDP, Phase I, was directed by DA in November 1975 to produce an Equipment Distribution Plan (EDP) to support the Army Materiel Plan (AMP). The Phase I system (now operational) was developed by utilizing existing ADP programs and was very inflexible. In addition, Phase I required considerable manual effort prior to the ADP processing. TAEDP Phase II was directed by DA, August 1976. The goal of Phase II was to reduce processing time (manual and ADP) to six hours and provide a flexible system that may be used for planning (answer "what if" questions) and output formats tailored to each level of management. Also, it provided the capability of time phasing the authorizations, requirements, procurement, distribution/redistribution and disposal. This portion of Phase II was given the title of Phased Equipment Modernization (PEM). Another goal was to provide an audit trail to show actual vs planned distribution. TAEDP, Phase II milestones accomplished in FY 1977 included the following:

- (1) DA approved the plan of action and resources required.
- (2) Personnel spaces were approved (15 are aboard).
- (3) The computational and audit logic was approved.
- (4) The plan of action and resources for PEM was approved.
- (5) The "general" output formats were approved.

(U) DARCOM Regulation 700-5, Major Item Management. Action was taken (Aug 77) to revise this regulation in order to provide specific guidance at the major item manager level.

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(U) Continuing Balance System-Expanded (CBS-X). At DA direction, CBS was being expanded from MACOM to unit level. The Plan of Action was approved.

DOD Materiel Distribution System (DODMDS)

(U) During FY 1977, the DODMDS Study Group was engaged in the development of aggregations of data concerning the wholesale DOD Materiel Distribution System and preparing this data for utilization in computerized optimization and simulation models. This was being used to evaluate the existing distribution system and provide insights for possible improvements in that system. Data collected and aggregated dealt with depot operating costs, transportation costs, and the flows of materiel from supply sources through intermediate stock points (depots) to DOD activities throughout the world.

(U) In June 1977 the DODMDS Study Group began to model the data previously collected. Modeling continued for the remainder of the fiscal year as alternate scenarios were developed to test various hypotheses concerning potential improvements in the DOD wholesale distribution system.

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CHAPTER IV READINESS

Introduction

Mission

(U) The mission of the Director of Readiness was to: establish policy and provide guidance and direction to assure that materiel was fielded, or to be fielded, meet user requirements and was logistically supportable throughout the life cycle; assure that the principles of integrated logistic support planning were followed, in developing and fielding new weapon systems and equipment; evaluate Army Materiel Readiness; promote DARCOM's ability to meet Army readiness goals in peace and war, including the means to identify deficiencies which contributed to qualitative and quantitative shortfalls in readiness; to highlight major supply and maintenance shortfalls which reduced or degraded readiness; and to provide intensive management to logistic problem areas until the Army readiness goals were satisfied; assure product improvement of fielded weapon systems and equipment; and operate a logistic assistance program responsive to the requirements of the using command and DARCOM. Other parts of the mission required the Director of Readiness to: coordinate the release of new weapon systems and equipment to the field; operate a Logistic/System Assessment Program (Red Team) for the periodic and systematic review of specified weapon systems and equipment; manage the DA Test, Measurement and Diagnostic Equipment (TMDE) Program; provide for career management of readiness personnel; and exercise operating control over the Maintenance Management Center and the worldwide network of Logistic Assistance Offices.

Goal

(U) The Readiness goal headed the list of the total Army goals cited by the Secretary of the Army, Clifford L. Alexander;¹ similarly materiel readiness became the primary concern of DARCOM for FY 1977.

(U) While the US Army was in Southeast Asia, the Warsaw Pact nations continued their development and modernization programs--at a time when we were forced to withdraw resources from the Army in Europe. Before the United States could rebuild, the 1973 war in the Middle East occurred. Many critical items such as tanks, armored personnel carriers, and self-propelled artillery pieces were withdrawn from stocks in Europe and sent to Israel.²

¹ Army Logistician Magazine, January-February 1978

² "Improving Army Readiness," speech by Clifford L. Alexander, Jr., Sec of the Army, to the Central Kansas and Fort Riley Chapter of the Association of the US Army, Fort Riley, Kansas, 15 August 1977.

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(U) DARCOM's most direct contribution to readiness was through its responsibility for supply and maintenance.³ Supply support for about 550 Army units and installations worldwide was provided through the direct support system (DSS). Under this concept, supplies were distributed directly from the wholesale (depot level) to direct support unit (DSU) and general-support unit (GSU) levels of supply such as overseas depots and the continental U.S. (CONUS) post, camp, and station installation supply activities.

(U) The results of DSS seemed encouraging. Although the order-ship time objective of 45 days was not achieved for normal replenishment requisitions, the order-ship time for Europe was reduced from a pre-DSS figure of 130-150 days to 51 days. For CONUS DSU's and installation supply activities order-ship time was 25-28 days, and for Korea it was 59 days.

(U) Several reasons for not achieving the order-ship time objectives included: the time required for the DSU to get requisitions to the wholesale system; the time required for the DSU to pick items up on stock records once the supplies were received; and DARCOM's inability to make 90 percent of shipments from the appropriate distribution depots and to meet all depot processing times.

(U) The objective was to reduce order-ship time to 20 days. Actual performance was running between 29 and 31 days for many of the same reasons that DSS had not reached its goal. Further improvements were anticipated since DSU's in Europe had begun submitting requisitions directly to CONUS, thus bypassing the USAREUR Materiel Management Center, and as the number of Defense Logistics Agency (DLA) stocks on hand at New Cumberland increased.

(U) Another plan to enhance readiness and sustainability of the Army in the field and to improve the logistical support for weapons and equipment is the Direct Logistical Support (DLS).⁴

(U) This concept was conceived by a task group composed of representatives from DA, DARCOM, FORSCOM, and TRADOC. The task group had been directed to develop a means to force continuing consideration of the relationship of personnel, training, doctrine and funding to functional logistics. Following some preliminary testing at Fort Hood, Texas, DARCOM will have the task of making the DLS plan work worldwide.

³"No Weak Links in the Readiness Chain," by GEN John R. Guthrie, Army Magazine, October 1977.

⁴"Direct Logistical Support-New Eyes and Ears for DARCOM," by COL Carmine P. Giordano, page 21, Army Research and Development News Magazine, August-September 1977.

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(U) DLS embodied five major thrusts designed to:

(1) Establish technical channels of communication through all echelons of the Army from DA to the user. It would permit the free flow of logistics information and intelligence up, and guidance and solutions down.

(2) Provide enhanced missions to DARCOM readiness commands by augmenting responsibility for weapon system management with the requirement for maintaining visibility of all problems influencing these systems, regardless of their cause.

(3) Make extensive use of logistics systems overseas, field maintenance technicians and other field advisory personnel such as logistics management specialists. They will form the backbone of the technical channel.

(4) Prevent new management information or automatic data processing systems to be introduced; and

(5) To assure there would be no change to the current Army organization and logistic support structure.

Key Personnel

(U) During the period 1 October 1976 to 30 September 1977, the Directorate for Readiness underwent various personnel changes. Major General E. L. Konopnicki reported in July 1977 as the Director. In June 1977, Colonel Eugene Dolfi was assigned as Associate Director for Integrated Logistics Support vice Colonel James J. O'Quinn. Lieutenant Colonel Keith E. Lundin was assigned Acting Assistant for ILS Development and Deployment vice Colonel Eugene Dolfi, and Mr. Willard F. Stratton was assigned as Assistant for ILS Data Application in January. In July 1977, Lieutenant Colonel Lark R. Murray was assigned as the TMDE Project Officer vice Lieutenant Colonel Mial.

Integrated Logistics Support (ILS)

(U) Although Integrated Logistics Support (ILS) has changed in form since its inception in 1964, the objective remains to strike an optimum balance between total system performance, cost, and schedule while developing an integrated support system.⁵ As with all new ideas,

⁵"A Retrospective Look, The Yesterday, Today, and Tomorrow of Integrated Logistics Support," by MAJ Ned H. Criscimagna, USAF, in Defense Management Journal, October 1977.

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ILS was greeted with mixed emotions. DOD and the defense industry had been saturated with "integrated systems," "systems engineering," "cost effectiveness," "system effectiveness," and a seemingly endless list of new disciplines and management philosophies. There were many who felt that ILS would be just another busy word that would soon be discarded.

(U) The seven basic elements of the ILS concept as defined in DOD Directive 4100.35 included planned maintenance, spares and repair parts, support equipment, technical logistics data and information, contract maintenance, logistics support personnel, and facilities. Some of the key points made by its proponents were that ILS was necessary for the development of an effective and economical support system; for the most part the cost of ownership of weapon systems far exceeded the development and investment costs; the cost of ownership of weapon systems was most effectively controlled by emphasis on ILS as early in the conceptual phase of the system as possible; and ILS represented the start-to-finish life-cycle planning of total maintenance and logistics support of weapon systems.

(U) Despite the progress made since 1964, there still remained much to be done. Some of the early misgivings about ILS persisted, and some program managers still have to be sold on ILS. This is necessary not to overcome resistance to good support planning, but because of the current management and budgeting environment. The budgetary pressures put on the program manager is a case in point. Asked to plan several years in the future, he is given money one year at a time; but the exact amount is not known until the budget is approved by Congress. Months of careful planning at the program level can be negated when the upcoming fiscal year budget is cut. This in turn may require reprogramming, delaying, reducing, or eliminating certain tasks. Deciding which tasks are to be is normally done on the basis of immediate need; that is, those tasks needed today, such as hardware design, are kept constant at the expense of tasks which do not have a first-hand effect on the program. Such tasks include ILS, reliability demonstration, development of technical manuals, and related "supporting" tasks.

(U) The concept of making early, relatively small investments in order to realize a lower life cycle is central to the ILS philosophy. Only when ILS is implemented early and afforded a chance to impact design can the intent of ILS be met. Without this front-end investment, ILS can often do no more than develop the least expensive support system for a patently unsupportable weapon system.

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(U) The analytical tools developed in the area of ILS, such as logistics support analysis, optimum repair-level analysis, and various cost models, are reasonably accepted as meaningful and useful. Still, the validity of any analysis is largely dependent on the accuracy of the data used. Herein lies the dilemma of the decision maker regarding ILS: the early phases of the program, when the ILS analysis is most effective in influencing design, are the times when the data is very "soft." The program manager is reluctant to implement a design change at a cost of, for example, \$100,000, simply because ILS analysis based on soft data indicates an LCC savings of \$1 million over the present design. If the decision is delayed until the data is "dependable" change may be impractical because of the implementation cost and schedule impact. The net result is that many of these LCC-affecting changes are not made.

(U) Three solutions are suggested. The ILS community must recognize and appreciate the real-world constraints placed on the program manager who is tasked to bring in a program on schedule and within a budget which he only knows a year at a time. With minimal discretionary funds available to him, he is asked to explore alternatives and change the program plan as needed in order to minimize life cycle costs and achieve the operational requirements. The second possible solution is to continue to improve the training of ILS personnel. Finally, the ILS career field should be made attractive. The rationale being that if ILS is to compete with more glamorous career fields, then opportunities for promotion, education, and job advancement must be fostered by the highest management levels.

DARCOM-TRADOC Interface

(U) A common effort with TRADOC was essential to enable ILS to effectively influence design, logistic support, and materiel readiness of new weapon systems. With this in mind, during the past year extensive effort was devoted to development and clarification of the DARCOM-TRADOC interface. This effort was undertaken through coordination of regulations, a joint effort on preparation of a DA ILS Management Model (DA Pamphlet), the preparation of proposed ILS coverage in the existing TRADOC-DARCOM Materiel Acquisition Handbook, and a joint effort on a set of TRADOC-DARCOM ILS Interface Descriptions keyed to the DA Life Cycle System Management Model for Army Systems.

ILS Executive Course

(U) A new course of instruction has been initiated at the US Army Logistics Management Center, titled "Integrated Logistics Support Executive Course." The Plan of Instruction was completed and was being staffed. It is estimated the first class will start early in 1978. The course curriculum, which will be limited to 40 hours

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in duration, will include the overview of the materiel acquisition process and life cycle management, the ILS prerequisites for advancing into each phase of the life cycle, management reviews for ILS assessment by higher headquarters, organization for ILS management at all levels, and the assessment of critical ILS milestones and performance measurement indicators. Other facets of the course will pertain to the cost considerations in ILS planning and management, contracting for ILS, requirement and management control documentation and their ILS interface, sampling of quantitative techniques, and specific management techniques in evaluating, monitoring and reviewing the ILS effort for items/systems at all levels; ILS management review teams, LSAR review teams, and design review teams. The primary purpose of this course is for a better understanding of the ILS management concept and practice, and improved managerial skills in areas of communication and teamwork, planning, problem solving, decision-making, and evaluation and measurement. Finally, the course will give a better understanding of the steps to organize for effective ILS for all item/system acquisitions leading to a fully supportable item/system at minimum operational and support (O&S) costs during its life cycle.

Second DARCOM Maintainability Symposium

(U) Under the sponsorship of the Society of Logistics Engineers the subject symposium was held on 22-25 February 1977 at Orlando, Florida. The meeting was well attended by both DOD and industry, and a variety of speakers from both industry and DOD spoke on the theme "Attacking O&S Costs." The role of Maintainability to enhance support and reduce O&S costs while the end item was in the formulating stage was thoroughly discussed and many new ideas were presented. Recommendations of the Symposium resulted in the development of the following tasks: review Maintainability Engineering Training to include more ILS, work closely with AFLC, Wright-Patterson, monitor LSAR tailoring, document cost effectiveness of LSAR, investigate effectiveness of Mil Handbook 472 and revisions required, and investigate Pershing O&S cost model.

Integrated Logistic Support (ILS) Milestone Reporting System

(U) DARCOM Regulation 700-13, now being staffed, establishes a reporting system that will permit managers at all levels to assure that support is being developed and provided simultaneously with the end item being acquired.

(U) The system is being established so that ADP Terminals will ultimately be used at all levels to access and compile data both in individual systems and on accomplishments of the ILS program. Through this medium, individual managers will control their programs scheduling

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and accomplishment and intermediate management will control the ILS systems with management overview from the Headquarters. With the ADP terminal all levels of management will have available that current, detailed information necessary for their current tasks as well as the summaries necessary for overall management.

National Guard Training

(U) Caused HQ DA to resolve the responsibility between MACOM's as to whom the Army National Guard should look for training. The issue was one of DARCOM/TRADOC responsibility in the areas of NET/school training. The issue was resolved in consonance with the DARCOM position; i.e., the National Guard is entitled to the provisions of AR 71-5, no exceptions being necessary. The exception was being sought by the National Guard and was to have DARCOM train the National Guard despite this training being the responsibility of TRADOC.

Logistics Command Assessment of Projects (LOGCAP)

(U) LOGCAP are a series of command assessments conducted at pertinent points during the acquisition process to assure the logistics is included as a major design/acquisition parameter and to evaluate logistics support planning, programming and execution. The following is a tabulation of the LOGCAP's held during the year, annotated with key remarks.

| <u>System</u> | <u>Date Conducted</u> |
|---------------------------|-----------------------|
| UTTAS | 23 November 1977 |
| MAG 58 MG | 5 January 1977 |
| STINGER | 26 January 1977 |
| Infantry Fighting Vehicle | 31 March 1977 |
| XM-1 Tank | 14 April 1977 |
| 200 KW Generator | 25 July 1977 |
| DRAGON | 1 September 1977 |
| ROLAND | 1 September 1977 |
| FAMECE/UET | 12 September 1977 |
| Quicklook/Guard Rail | 23 September 1977 |
| XM911/915 HET | 27 September 1977 |
| AN/TPQ-36 | 28 September 1977 |
| STINGER | 5 October 1977 |

ILS Meeting

(U) Key representatives of the ILS community met at MERADCOM, Fort Belvoir, Virginia, during the period of 21-23 June 1977 to evaluate the program's performance and progress for the year.⁶ It also

⁶Summary Report-ILS Meeting, 21-23 June 1977.

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served to identify problems and future plans and to promote an exchange of ideas among the ILS managers. The management workshop session provided an exchange of ideas and individual command programs and approaches to the ILS program.

(U) Participants were of the opinion that it was essential that the DARCOM elements maintain command emphasis on the CCSS/LSAR interface for provisioning until output summaries were running at all commands. A major concern expressed during the workshop was the lack of enough doers (action officers) in the Readiness Commands. Also, discussions on materiel requirements and development planning documents disclosed ILS offices as a group were not adequately involved in program decisions such as setting the Initial Operational Capability (IOC) date or in developing, reviewing or approving basic program documents, such as Letter of Agreement (LOA), Required Operational Capability (ROC), and Development Plans (DP).

(U) Other problems presented at the workshop showed a need for better orientation of development managers on the ILS coordination interfaces for improved regulations with respect to adequacy and clarity and for resolution of problems in preparing ILS documentation for the LOA and ROC. The review of such documents in the Directorate for Readiness, HQ DARCOM, confirmed the need for action in these areas. Specifically, this review in HQ DARCOM (DRCRE) showed that non-concurrences or adverse comments were made on 46 percent of the LOA and 41 percent of the ROC/LR received during the period of January 1966-March 1977. Consequently, concerned ILS offices in major subordinate commands were placed on distribution for information copies of DRCRE comments on such documents.

(U) More dialogue was needed between ILS offices in PM offices, Development Commands, and Readiness Commands, their command Comptrollers and each of the DARCOM Headquarters counterparts in the accomplishment of planning, programming, and budgeting for manpower and funding resources. It was also decided that the materiel developer and Readiness Command must exchange planning information prior to budget actions. At the close of the meeting, the DARCOM Chief of Staff addressed the recognized resource problem by stating that even though extraordinary actions might have to be taken, DARCOM policy will not allow fielding of new equipment until it is adequate and fully supportable.

ILS Procedures for Design Reviews

(U) The concept and policy for technical design reviews was established in January 1977. This would assure that the logistics issues are included in design reviews.⁷

⁷Ltr, DRCRE-IP/3, 21 Jul 77, Subj: ILS Procedures for Design Reviews.

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(U) A variety of hardware development problems could have been detected and overcome by design reviews.⁸ For example, the electronic part that failed because a circuit analysis was omitted and the omission was never questioned; the component that was haphazardly selected without anyone bringing to bear the corporate memory that would have shown its inadequacy; and the specification requirements that did not properly characterize equipment performance and the stress analysis that was done after test failure but which would have been cheaper to do before failure.

(U) ILS procedures are most prevalent during the validation and full scale development phases of the Life Cycle Process. The design review, during the validation phase, is that period which special logistics problems previously identified should be optimized. This logistic assessment will also identify procedures which have an impact on full-scale development of the materiel and logistic support system.

(U) The procedures considered to be of primary importance in the early stages of acquisition are maintainability, design for life cycle cost, and portability, whereas in the later stages, TM's, provisioning, spares, TMDE, and facilities will be the primary factors. During these design reviews, input should be provided by "dirty rag" mechanics and other user types so as to include Army field experience. ILS is a principal design parameter and must influence design. As such, logistics support will be integrated into the entire design and development process leading to a total logistic support system.

Force Status and Customer Assistance

Reconstitution of Prepositioned Materiel Configured to Unit Sets (POMCUS) Stocks (U) (FS)

(C) Department of the Army established on 24 January 1977⁹ a plan for the Reconstitution of Prepositioned Materiel Configured to Unit Sets (POMCUS) Stocks, and assigned specific POMCUS responsibilities to DARCOM. The objective of the plan was to reconstitute POMCUS stocks, as a matter of priority, to a 100 percent level of fill. On 14 February 1977,¹⁰ established 100 percent fill dates for each

⁸Ltr, DRCDE-DG, 31 Jan 77, Subj: Concept and Policy for the Conduct of Design Reviews During the Development Process.

⁹Deputy Chief of Staff for Logistics ltr dtd 24 Jan 77, Subj: Department of the Army Plan for Reconstitution of Prepositioned Materiel Configured to Unit Sets (POMCUS) Stocks (U).

¹⁰Vice Chief of Staff memorandum dtd 14 Feb 77, Subj: DA POMCUS Reconstitution.

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of the four POMCUS packages (REFORGER, 2+10, MR LOGAEUR, and Medical Augmentation), and also fill dates for ten intensively managed POMCUS critical items. These POMCUS fill dates were subsequently revised in August 1977 by the VCSA. DARCOM managed POMCUS on an intensified basis. Considerable progress was made in accelerating the fill of POMCUS, and projections indicated that improvement will continue to be made at a rapid pace. DARCOM was required, on a quarterly basis, to furnish DA with an analysis including appropriate charts reflecting the status of each POMCUS package, and the ten intensively managed critical items. This analysis and charts were included in the quarterly POMCUS status report furnished by DA to the VCSA. Twice the Commander, USAREUR Materiel Management Center, convened a Review Board meeting at Zweibruecken, Germany. During the Review Board meetings, a detailed review was made of each POMCUS item and actions taken to fill shortages from available USAREUR resources. DARCOM was represented at both meetings and will provide a representative at the meeting scheduled for period 31 October - 2 November 1977.

(C) Under POMCUS, special self-contained sets of materiel were pre-positioned in Europe and identified for specific companies and battalions. This would enable a unit to deploy rapidly by air without the bulk of its supplies and equipment, and to fall in on a pre-stocked materiel in certain geographic areas.¹¹ The concept lightened the logistics burden of transporting the unit with its equipment and thus greatly enhanced strategic mobility.

(C) In case of war, when the initial equipment and supplies are lost or consumed, commanders will be able to draw replacements from pre-positioned war reserve materiel stocks greatly increased the capability to sustain front line units, and strengthening their resistance to the attacking Warsaw Pact forces. Included were rations, medical supplies, and clothing to support the soldier. To support the units were replacement tanks, armored personnel carriers, howitzers, and other munitions. Pre-positioned war reserve stockage sites were also located in the United Kingdom, Italy, Alaska, the Canal Zone, Hawaii, Korea, and Japan.

TASK FORCE 16-76

(C) Task Force 16-76 (TF 16-76) continued actions, initiated during FY 1975 and FY 1976, which were intended to bring the Project 16-76 units (5th, 7th, and 24th Infantry Divisions, and 194th Armored Brigade) to the assigned Authorized Level of Organization (ALO). The Project 16-76 units were assigned ALO 2. For ALO 2 units, the Equipment on Hand (EOH) Readiness Condition (REDCON) C-2 required that at

¹¹"War Reserves - Stockpiles for Defense," by Steven Roman, Army Logistician, January-February 1978.

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least 90 percent of the reportable MTOE lines be filled to at least 80 percent of the required quantity.

(C) The target dates for achievement of ALO 2 for the Project 16-76 units are as follows: 7th Infantry Division and 194th Armored Brigade - 30 September 1977; 5th and 24th Infantry Division - 30 September 1978.

(C) During March 1977, TF 16-76 hosted its third Long Lead Time Item (LLTI) conference to discuss those items which were projected as having deliveries scheduled past 4th Quarter FY 1977. As a result of this conference, the TF 16-76 office projected that three of the units (194th Arm Bde, 24th Inf Div, and 5th Inf Div) would meet their assigned ALO prior to December 1977.

(C) The adverse projection on the 7th Infantry Division resulted in an intensified effort by the DA, FORSCOM, and TF 16-76 staffs to improve the availability of equipment required. This effort by the three staffs enabled the 7th Inf Div to reach EOH REDCON C-2 in August 1977. The 194th Armored Brigade was also able to reach EOH REDCON C-2 in July 1977.

(C) Overall, of 77 divisional and brigade units activated during FY 1975 and FY 1976, 66 (86 percent) were attained or exceeded the assigned EOH REDCON C-2. Eight of the 11 units which did not achieve EOH REDCON C-2 were reorganized during FY 1977. These units probably would have attained EOH REDCON C-2 had not these reorganizations occurred. This would have brought the percentage of units achieving EOH REDCON C-2 up to 96 percent.

(C) The FY 1977 activations included the activation of the second brigades of the 24th and 5th Infantry Divisions and major reorganizations of basic elements of all three divisions. There are several reorganizations scheduled to occur during FY 1978; i.e., 7th Infantry Division - 2 Chaparral Batteries, one Target Acquisition Battery; 24th Infantry Division - one Chaparral Battery; 5th Infantry Division - one Chaparral Battery.

(C) Prior to and since the activation of the 2nd Brigade of the 24th Infantry Division, there were major reorganizations within the Brigade. Before the Brigade was actually activated but after the majority of requisitions had already been dropped, the 2nd Brigade was reorganized from an Infantry configuration to an armor configuration. This reorganization entailed rescinding the activation of two infantry battalions and activating in their place two armor battalions, reorganization of the 2/9 Air Cavalry Squadron to a Ground Cavalry configuration using M551 ARAV's, and the reorganization of the Heavy Maintenance

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Company and one Forward Support Company of the 724th Maintenance Battalion to configurations better designed to support the other activations and reorganizations. Subsequent to the activation of the 2nd Brigade of the 24th Infantry Division, the decision was made by DA to convert the ground Cavalry troops in the 2d Squadron, 9th Cavalry from the M551's to M60A1 tanks. The revised MTOE's are currently being provided to the 24th Infantry Division so that requisitioning can commence.

(C) During July 1977, DA directed that the three new divisions and the 194th Armored Brigade would be changed from ALO-2 units to ALO-1 units during FY 1978. This change will necessitate increased requirements for many items in that the authorized quantity for an item in the MTOE will be increased to equal the required quantity for that item. The Task Force was in the process of conducting a special capability assessment study to determine DARCOM's capability to support these additional requirements and, concurrently, appraise the impact of the recent Department of Army Master Priority List increase for Reconstitution of Prepositioned Materiel Configured to Unit Sets (POMCUS) and Division Restructuring Study (DRS) - Phase II on the new divisions unfilled items. Responses for the Materiel Readiness Commands (MRC) will provide a data base from which DARCOM, in conjunction with FORSCOM, will determine and advise DA as to whether the ALO target dates can be met.

(C) Concurrent with the ALO-1 change, DA tasked the TF 16-76 office to provide a bi-weekly report showing the progress of these units toward the ALO-1 goal. This report included not only summary statistics but also showed which items were short to this goal and their availability.

Upgrade of TRADOC Service School Training Equipment

(U) The TRADOC training system received new equipment as it entered the Army inventory; however, issue priorities did not provide for timely supply of equipment which had been product improved, modified or overhauled. The result was that operators and maintenance personnel trained at the TRADOC schools often arrived in the field to find improved equipment on which they had not been trained. A coordinated DARCOM and TRADOC action was initiated to identify training equipment shortages, replacement, overhaul, modification and product improvements required to upgrade training equipment to acceptable standards.

(U) Raw data submitted to DARCOM by the training facilities were refined in coordination with the points of contact at the training facilities. This resulted in several major changes to reported

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requirements. The revised requirements were tabulated and returned to the applicable training facility for final review and resubmission by 1 September 1977. Concurrently, the DARCOM Logistic Assistance Office, TRADOC, was directed to provide assistance at the training facilities in the review and finalization of upgrading data.

(U) Beginning 9 September 1977, after receipt of sanitized data at HQ DARCOM, the DARCOM Materiel Readiness Commands, along with other applicable DARCOM agencies were requested to review requisitions and provide the best possible delivery dates. This action will surface the hardcore shortages and provide data for further assessment of the shortage problem.

(U) Concurrently, with the review of equipment shortages, equipment replacement, rebuild, modification and product improvement requirements were being tabulated. The updating requirements will be submitted to the DARCOM Materiel Readiness Commands for action. Requirements which could not be immediately satisfied will provide data for further assessment of the equipment updating problem.

(U) Upon identification of hardcore updating requirements, recommendations were to be developed for completion of updating actions and modification of current overhaul and distribution procedures, to preclude the updating problem from occurring in the future.

Readiness Posture of Active Army Major Combat Units

(U) In October 1976, the active Army was composed of 27 major combat units comprising divisions, separate brigades, and selected unique early deploying battalions. Each of the 27 major combat organizations attained a logistic Readiness Condition (REDCON) in Equipment on Hand (EOH) commensurate with assigned Authorized Level of Organization (ALO). Twenty-six of the 27 major combat units during October 1976 achieved an equipment status (REDCONS) commensurate with assigned ALO representing a 96 percent achievement.

(U) As of 20 September 1977 the active Army force was expanded with three additional divisions to 30 major combat units similarly configured to the October 1976 position. With the added major combat organizations, the 20 September 1977 EOH and ES achievement showed 28 of 30 major combat units meeting the Department of the Army readiness goal (93 percent).

(U) The outstanding unit readiness posture of the major combat units was attributed largely to the increased emphasis by DARCOM and Department of the Army to distribute the limited resources among competing claimants in a more efficient and effective manner.

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Reserve Components Dedicated Maintenance Program

(U) Since June 1976, DARCOM managed the Reserve Components Dedicated Maintenance Program (RCDMP) on an intensified basis. As a result of actions taken by DARCOM, completion programs for remaining selected items in the RCDMP were accelerated. The RCDMP data was updated on a bi-monthly basis and status reports furnished to the Chief National Guard Bureau.

Army Logistics Readiness Evaluation System (ALRES)

(U) On 1 August 1977, the Readiness Director at HQ DARCOM implemented the Army Logistics Readiness Evaluation System (ALRES), a computer assisted data manipulation procedure which combined unit materiel readiness reporting data to produce monthly summary reports. Planning and programming for ALRES implementation began during October 1976 with initial parameters consisting of the following: no new reporting requirements placed on the field Army, active or reserve components; summary reports provided would focus only on units and equipment failing to meet Department of the Army readiness goals; the system must provide additional management tools to DARCOM materiel readiness commands, major commands, DARCOM managers, and headquarters Department of the Army; the Maintenance Management Center at Lexington, Kentucky is the national custodian for Materiel Readiness reports, and was selected to act as DARCOM focal point for ALRES and provide the computer support necessary; ALRES produces the information which serves as a basis for DARCOM to not only provide Headquarters, Department of the Army a monthly readiness analysis, but to make significant logistics management decisions consistent with established readiness objectives; the implementation of ALRES significantly enhanced the productivity of analyst personnel and more effectively utilized their skills; no direct cost savings can be quantified but the quality of analysis performed was increased immeasurably.

US Support to United Nations Peacekeeping Operations

(U) Since 1948, DOD actively supported to some degree each of the 11 UN Peacekeeping Operations by providing initial non-reimbursable airlift and/or by providing follow-on goods and services (normally reimbursable) in the form of surface/air shipment of DOD major end items (vehicles, radios, troop support items) and spare parts. Of the 11 UN Peacekeeping Operations, five were still in existence, and an additional three were of considerable duration. Thus, only three operations had the transitory character originally envisioned.

(U) Logistical support furnished UN Peacekeeping Operations by United States Government (USG) originated from two primary sources.

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US Army Europe (USAREUR), via the 8th Logistical Command in Italy, and the US Army within the Continental US (CONUS). USAREUR support had been in effect since the first UN Emergency Force Operation of the mid-1950's (UNEF-I 1956-1967) and remained the major DOD support agency through the Congo Operation. The UN Supply Depot in Pisa, Italy (UNSD-Pisa) provided the UN contact with the 8th Logistical Command for this USAREUR support, which support in turn had been monitored by State Department, DOD, DA and USUN.

(U) USG logistical support for UN Peacekeeping Operations normally came at a time when there was need for immediate movement of large volumes of major end items. As operations became normalized, United Nations Supply Depot-Pisa traditionally took over routine day-to-day logistics administration tasks associated with USG supply of spare parts and some non-major end items. The UNSD-Pisa-USAREUR supply system for spare parts and non-major end items was implemented in September 1974.

(U) In September 1975, after the Sinai II accords had been signed between UAR and Israel, effecting a new greatly expanded UN-Patrolled Disengagement Zone in the Sinai, the UN again turned to USG with urgent requests for large volumes of major end items. These included troop supplies, communication equipment, optical equipment, base camp/prefabricated buildings, and air operations equipment. Shortly after final specific UN requirements had been determined through extensive coordination between USUN, State Department, and several DOD elements, USG furnished \$10 million worth of this capital equipment in the form of a non-reimbursable grant. This equipment was furnished on an extremely high priority basis, with the result that almost all the requested equipment was shipped within the time frames requested by the UN. Also included as part of this grant were quarterly shipments of spare parts for the capital equipment. In the year 1975, 96 percent of all line items requested by the UN were supported by USAREUR with four percent coming from CONUS direct. This declined to 93 percent in 1976, seven percent of which came directly from CONUS, excluding the \$10 million Grant. The percentage rose to 98 percent in 1977 with two percent (492 lines) coming from CONUS.

(U) In all the above years, the materiel furnished by USAREUR came from stocks on hand or requisitioned from the CONUS US Army Wholesale Supply System. Materiel was shipped to Camp Darby, Italy, then transferred to the UNSD-Pisa. Only stocked items in the supply system were furnished by USAREUR. It was agreed between the UN and USG that the US Army would not act as a procurement agency for the UN.

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Division Restructuring Study (DRS)

(U) This Command was actively involved in the Division Restructuring Study (DRS) effort and test. Also, the DARCOM representative attended the initial planning meeting held at Fort Hood, Texas, on 22-24 November 1976 for purpose of reviewing the total equipment requirements and identifying critical items for conducting the test.

(U) The Chief of Staff, Army (CSA) decision in January 1977 to conduct the test in three phases, over a longer period of time, required a new look to determine what items were available from the wholesale supply system. DARCOM again participated in a conference held on 23-25 March 1977 at DA to identify the source of supply for equipment shortages to support Phase I of the DRS test. Subsequent to the conference, DA identified those items which were to be requisitioned from the wholesale system and those which would require redistribution from FORSCOM and TRADOC assets. DARCOM customer assistance channels were used at the MRC's to provide weekly status and expedited delivery for meeting the 1 July 1977 Required Delivery Date for Phase I equipment.

(U) The shortages of equipment were identified by the 1st Cavalry Division for Phase II restructuring and DARCOM was required to determine availability of the required equipment from the wholesale system. Messages were sent to the respective commodity commands requesting availability and what theater/units would be impacted if items were diverted from the current distribution planning. The data was provided to DA, FORSCOM, TRADOC, and Fort Hood for use in preparing impact judgment decisions at a conference held at DA on 13-14 September 1977 for determining source and impact upon the logistics readiness posture for active Army and Reserve Component units.

(U) DARCOM continued to provide intensive support for the expedited release of equipment from procurement and/or overhaul, for the purpose of meeting the remaining shortages of equipment needed for Phase I testing.

DARCOM Readiness Hot List Program

(U) The DARCOM Readiness Hot List Program discussed in the FY 1976 Historical Review averaged 13 major systems for FY 1977. The majority of the system that failed to meet the DA Approved Worldwide Operationally Ready (OR) standard by a deviation of 5 percent or more were in the category of tactical vehicles and communication equipment. DARCOM Readiness Commands established intensive management programs for each system that failed to meet the established DA criteria. They were also required to furnish DARCOM with a detailed

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analysis of the "root" cause problem areas associated with each system and to indicate corrective actions taken. This analysis data was used to prepare an executive summary for each item appearing on the Readiness Hot List Program for submission to the Director of Readiness.

Critical Enlisted MOS Shortages

(U) The Critical Enlisted MOS Shortages study, initiated in August 1976, was a continuous program to focus attention to those MOS shortages that might impact on the Readiness posture of applicable major systems and Army units. A requirement was placed on the Logistics Studies Office (LSO), US Army Logistics Management Center, to develop a statistical correlation between critical logistic MOS shortages and equipment readiness. In June 1977 an analysis of critical MOS versus Not Operationally Ready, Maintenance (NORM) rates was developed by LSO and furnished DARCOM.¹²

Logistic Support of Reserve Components

(U) Under the current DA Military Priority List (DAMPL) approved by DA on 8 April 1976, designated Reserve Component (RC) roundout units were assigned a higher priority than certain active Army units. This action resulted in an increased quantity of Equipment on Hand (EOH) and Equipment Status (ES) for the RC.

(U) The Materiel Assistance Designated (MAD) reports received from the RC were processed on a priority basis by DARCOM and positive actions were taken to improve equipment availability dates consistent with DAMPL priority.

(U) As a result of the above actions, and actions taken by the Reserve Component, the RC units for the period April 1976 through April 1977 reflected a steady improvement in percentages of EOH and ES; i.e., RC EOH from 49 percent to 54 percent and the RC ES from 59 percent to 61 percent.

DARCOM Readiness Evaluation System (DRES)

(U) Based on briefing presented on 11 November 1976 by the Director of Plans, Doctrine and Systems, the DCGMR approved for further development and testing, a concept for periodic evaluation of the readiness of subordinate commands to perform their mission in peacetime and up to mobilization. The Directorate for Readiness (DRCRE-FS)

¹²Confidential Report on Relationship between Critical Enlisted MOS and Equipment NORM Rates, 24 June 1977 - LSO, US Army Logistics Management Ctr, Ft Lee, Virginia.

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was tasked to finalize and staff a DARCOM regulation on this concept through a series of Steering and Working Group meetings with input by selected representatives from staff directorates. A draft regulation on DRES was completed by DRCRE. This regulation set forth a reporting system which required designated activities to submit, semi-annually, an evaluation report on their resources allocation and management to HQ DARCOM (DRCRE-FS).

(U) The DRES report required a commander to determine the overall readiness condition of his command by the use of readiness indicators with a narrative indicating the readiness conditions of his resources areas in personnel, stock availability/stock funds, facilities, services, industrial preparedness, and funds. Its content will include: Part I - Commanders narrative, providing an explanation and evaluation of his resources areas which are less than fully ready; Part II - A form displaying 24 separate resources readiness indicators reported by the commander; and Part III - Used to report unique problems effecting readiness posture of an activity. In addition to the use of several precise readiness parameters, DRES will contain the subordinate commander's realistic assessment of the resources required to accomplish his assigned missions under peacetime and full mobilization conditions. It should, for the first time, provide DARCOM and the Army with a reasonable measure of the logistic base's ability to make a transition to, and meet, its mobilization requirements.¹³

(U) With the DRES report, readiness data will be developed which will provide this Headquarters a tool to assess DARCOM's overall readiness posture. Also, readiness trends and conditions could be determined as well as readiness problems which require resolution. The first DRES report was due in Headquarters DARCOM on 15 December 1977.

Direct Logistic Support

(U) The readiness and sustainability of the Army in the field were frequently impacted upon by factors outside the traditional logistics functions of supply, maintenance, transportation and services. Matters such as personnel, training, doctrine or funding were often the source of many problems that appeared on the surface to be due solely to a deficiency in the logistics system. Recognizing the need to detect the existence of these problem areas and to react to them while they were still in a relatively correctable state, a

¹³"No Weak Links in the Readiness Chain," by GEN John R. Guthrie, Army Magazine, October 1977.

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Task Group composed of DA, DARCOM, FORSCOM, TRADOC and other service representatives was established in August 1976 to develop a concept to force continuing consideration of the relationship of personnel, training, doctrine and funding to functional logistics. The concept as developed was called Direct Logistics Support (DLS) and had as its overall objective the improvement in the readiness and sustainability of the Army in the field.

(U) A most basic precept of DLS is to detect and solve problems at the lowest level. This, in practice, had the thrust effect of reorienting the primary logistic assistance effort, from the Director of Industrial Operations (DIO)-dominated station level down to the organizational units. This did two important things: it directed entry into the internal sources of problems where trouble began; and caused a reassociation of DARCOM with the G-4 and those who set priorities.

(U) The DLS concept was tested at Fort Hood, Texas during the period 1 March through 31 August 1977, and evaluated by the TRADOC Combined Arms Test Activity (TCATA). Results of the DLS test at Fort Hood were successful. It had been recommended that DARCOM Logistic Assistance Activities (DLAA) be established at Division, Corps, and Major Command levels. Their prime orientation will be towards the Division Support Command, Corps Support Command, and Major Command staff elements. Each DLAA will orchestrate all DARCOM assistance in its area. This arrangement was somewhat similar to the LAO's established by DARCOM in the Continental United States, but did not now exist overseas. These DLAA's became the key links in the technical channels from the DARCOM Materiel Readiness Commands to the user. They will address logistic problems identified by the command and actively assist in their resolution as close to the user as possible. In addition to having expertise in hardware, they will provide a capability to evaluate operation of the logistic system itself.

USAREUR Logistics Support

(U) In a study begun in January 1977, a study group headed by Major General Joseph E. Pieklik, USA (Ret) conducted an intensive research and analysis effort to examine the doctrinal basis for current logistics practices and procedures in US Army, Europe (USAREUR).¹⁴ The study examined relationships among combat service support units in the communications zone (COMMZ) and the corps, the wholesale logistics systems, and the allied logistics system.

¹⁴"Updating USAREUR Logistics Support," in ARMY LOGISTICIAN, January-February 1978.

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(U) From the 32 objectives and 13 essential elements of analysis, the final report emerged with six major logistics issues. They included (1) the size and composition of the general support base in the corps, (2) the size and composition of the general support base in the communication zone, (3) the theater war reserves, (4) the wholesale logistics role in the communications zone, (5) the theater commander's role in a multinational environment, and (6) the host nation support.

(U) Conclusions and recommendations were consolidated into 22 major concepts for logistics support of USAREUR, and formed the basis for detailed logistics policy and doctrine development. The approved major concepts for logistics support of USAREUR included:

(U) Corps general support transitions to war with a minimum of several days of theater reserve stocks.

(U) Corps general support is based on CONUS for ALOC Class IX and on the COMMZ for controlled and tonnage types of items in all supply classes.

(U) General support maintenance, in support of the supply system, generally will be performed outside the corps. (Pending approval in principle).

(U) Corps general support maintenance is oriented to support forward and return highest possible percentage of weapon systems to combat forces. (Pending approval in principle).

(U) Corps general support base sustaining stockage levels in wartime provide for the capability to use it or move it.

(U) Pre-positioned theater war reserves require a priority consistent with that of the force it supports.

(U) Pre-positioned theater war reserve stocks should be dispersed in the communications zone and the corps to reduce vulnerability and to reduce the time required to get the materiel into battle.

(U) Wartime sustaining supply level in the COMMZ will contain several weeks of all classes of supply except airlifted items.

(U) COMMZ sustaining supply level provides the theater Army commander with the logistics resources to support the battle. Sustaining tonnages can be lower in wartime than tonnages pre-stocked in peacetime.

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(U) COMMZ general support maintenance is oriented to back up the corps and to support of units in and passing through the COMMZ DARCOM supports theater supply system. (Pending approval in principle).

(U) Separate theater total system managers are required for Classes V, III, I, selected major weapon systems, maintenance, and transportation.

(U) Total system managers call forward pre-planned supply and arranges receipt, storage, and issue as required in current operation plans.

(U) Theater reserves and preplanned supply are tailored for throughput to corps in multiples of 5-day support packages for all supply classes except IX which is always requisitioned.

(U) Theater reserves are dispersed in peacetime to form wartime general support nucleus and to facilitate distribution of CONUS reserves and preplanned supply.

(U) Wholesaler performs in war as he performs in peace.

(U) Wholesaler performs general support maintenance to support the supply system. (Pending approval in principle).

(U) Wholesaler manages post operations for the theater commander.

(U) Wholesaler manages Class I and performs property disposal for the theater commander.

(U) Wholesale activities operate under control of the theater commander by memorandums of understanding.

(U) Condition warfare must be logistically supported by making logistics an alliance responsibility.

(U) United States seeks optimum host nation support.

(U) (One major objective was classified and was not listed).

(U) It was recommended that the corps general support base transition to wartime with a minimum of several days of theater reserve stocks at wartime consumption rates. Priorities for all pre-positioned supplies had to be consistent with the priority of the supported force. Theater reserve stocks in the communications zone

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were to be restricted to combat essential and heavy tonnage items only. These were to be dispersed to reduce vulnerability to attack and to increase their accessibility to the corps maneuver elements.

(U) The corps wartime support base will be in the communications zone, except for Class IX repair parts and other selected items that would be airlifted from continental United States. In peacetime, the corps support will be based on communications zone except for items supplied through the Direct Support System (DSS).

(U) A sustaining level of several weeks supply will be maintained in the communications zone. This level will be restricted to regulated and tonnage types of items which will preclude a massive supply buildup in the communications zone.

(U) Theater reserves held in continental United States and pre-planned supply will be tailored into 5-days-of-supply support packages. These packages will be throughout to corps and division units.

(U) A significant departure from the way in which the business of logistics has been conducted will be realized through the establishment of total system managers. These managers will be required for each of the critical classes of supply - I, III, and V - and for major weapon systems, maintenance, and transportation. They will plan, evaluate, and supervise all aspects of support associated with their assigned logistics function. The total system managers will be part of the theater Army staff and control theater resources required for accomplishing their assigned logistics function.

(U) Maintenance doctrine and philosophy will undergo a major change if the study recommendations are approved for implementation. The primary mission of the corps general support maintenance will be to provide support forward. The objective will be to return to the combat forces the highest possible percentage of operable weapon systems in the shortest period of time.

(U) Guidelines for general support maintenance in the corps will be dictated by the tempo of the battle, the availability of time and resources, and the environment. In general, if the item cannot be repaired by the direct support unit within 24 to 36 hours, a general support contact team will fix it forward. If not repairable within 72 to 96 hours, it will be evacuated. Cannibalization will be emphasized in peace and war.

(U) DARCOM will support the theater supply system by repairing and overhauling end items, components, and assemblies using production-line techniques. This function will be performed in the communications zone.

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(U) In the past, the overseas theater was the exclusive domain of the theater commander. Over the past few years DARCOM, the Defense Logistics Agency, and the Military Traffic Management Command assumed responsibility for logistics functions in USAREUR. Thus, the theater became reliant on these arrangements.

(U) DARCOM operated depot maintenance facilities while Defense Logistics Agency was responsible for subsistence and petroleum, oil, and lubrications. Military Traffic Management Command managed European port operations. Policy, doctrine, and procedures were to be developed to establish the wholesalers' missions as integral parts of the theater Army.

(U) The above represent a few of the major changes that are likely to take place in the logistics support of USAREUR. These changes are more likely to be evolutionary than revolutionary.

Restructured General Support Concepts

(U) TRADOC completed and DA approved the study on the Combat Oriented General Support now known as Restructured General Support (RGS).¹⁵ It was anticipated that this new concept would cause considerable turbulence throughout the Total Army during implementation. Therefore, the evaluation of RGS concept would have to be closely coordinated with and have the active participation of both the active and reserve components of the Army.

(U) Over 65 percent of the Combat Service Support (CSS) resources for the Total Army come from the reserve components. Consequently, the turbulence which could result from implementing this advanced logistical concept would have to be justified in terms of new efficiencies. The concept of Direct Logistics Support (DLS) was compatible with RGS; hence, the DLS concept was to be evaluated to the maximum practical extent with evaluating RGS.

(U) The overall evaluation of RGS will be sponsored by the Army Staff (DALO-SM) with HQ TRADOC being requested to prepare the overall plan for evaluation and implementation, conduct the evaluation and analysis and submit the final report to Headquarters, DA. Headquarters, TRADOC, will need significant support from HQ FORSCOM and HQ DARCOM, the Chief of the National Guard Bureau and the Office, Chief Army Reserve. Headquarters, USAREUR, was requested to provide coordination and planning support to HQ TRADOC as appropriate for consideration of the applicability of this concept to the European environment.

¹⁵Ltr, DALO-SMM-F, 2 Dec 76; Subj: Evaluation and Implementation of Restructured General Support Concepts (formerly Combat Oriented General Support).

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(U) Headquarters, TRADOC, was requested to develop a plan which would include evaluation and implementation of RGS concept throughout the Army. The plan should include milestones for the evaluation and milestones for the various phases of integrating the new concept into the force structure.

(U) Also, TRADOC was requested to continue developing the Outline Test Plan and a detailed test plan for evaluating an Armament and Combat Vehicle Materiel Center at Fort Hood, Texas. The field evaluation was to be approved by the Test Schedule and Review Committee (TSARC). This Materiel center should use a reduced organizational structure with emphasis on support of armored vehicles. The total RGS system should be simulated to the maximum extent possible. Personnel from the reserve components must be used in an annual training or active duty training status during the course of the evaluation. Every opportunity should be taken to measure how this support structure meshes with the Army's entire logistics support system. Full use should be made of the technical channels provided by the Direct Logistics Support (DLS) concept. The collection of evaluation data was to begin 1 March 1977 and terminate 30 September 1977. Further, TRADOC was to consider the practicality of evaluating the Realignment of Supply Activities (RASA) concept with RGS. It was to identify the type unit by TO&E number which was to be inactivated as reorganized to form materiel support centers and their support elements, and compare the proposed Restructured General Support organizational structure with the current organization to determine manpower costs and savings associated with fully implementing RGS.

(U) FORSCOM was requested to support HQ TRADOC in planning for and evaluation of an Armament and Combat Vehicle Materiel Center at Fort Hood, Texas, and identify as early as possible any additional resources required to support this field evaluation. It was to provide HQ TRADOC with an assessment of the impact RGS concept will have on the FORSCOM structure, with particular analysis made of the turbulence which may develop in the Army reserve. This assessment should consider command and control structure which may be required in the reserve units for peacetime, day-to-day operations of the maintenance elements. Further, FORSCOM was asked to identify specific units in the command which would be affected by implementing RGS and determine the number, location and MOS of personnel requiring re-training.

(U) Headquarters, DARCOM, was requested to continue to provide advice and assistance to HQ TRADOC and HQ FORSCOM in developing a plan for evaluating a portion of Direct Logistic Support in conjunction with the Field Development Test and Evaluation of Restructured General Support at Fort Hood.

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Equipment Improvement

Modification Work Order (MWO) Improvement Program

(U) Planning data and certain accomplishment information required for presentation to the General Officer Product Improvement Review Board (GOPIRB) proved to be inadequate. As a result, the PILOT APPROACH was developed in August 1977 to include information such as quantity and cost of mod/conversion kits on hand or to be delivered and estimated manhours to apply. It was planned to automate the PILOT after sufficient cycles were generated to provide historical experience regarding data elements, credibility and source data. Reporting on an automated basis should be completed within FY 1978 to provide a standard, routine planning summary with selected back-up detail for use at HQ DARCOM level and above.

Improving Visibility and Control of Equipment Improvement

(U) Products from the central (DESCOM) data bank were developed to identify status of kit application programs at the detail and summary level for distribution to HQ DARCOM, DA staff and major subordinate commands. Further development is underway. Planned visibility permitted display of dollar values for planned programs, obligations and costs incurred by major group and by MRC on a monthly basis. Planning data at comparable levels was anticipated within FY 1978.

Memoranda of Understanding (MOU) for Modification

(U) Successful MOU's were accomplished with all major commands. While negotiation meetings were required in Europe and CONUS, some MOU's were negotiated by correspondence to eliminate TDY/TRAVEL costs where possible. MOU's negotiated by ECOM (now CERCOM) resulted in reimbursement to several field activities for the installation of modification work order kits as agreed to costs. Negotiations for the FY 1978 program were underway but behind schedule.

Equipment Improvement Publications Activity

(U) AR 750-10 and DARCOM-R 750-50, for which this Directorate was proponent, were finalized and published circa 1 June 1977. DARCOM-R 750-50 implemented AR 750-10 and AR 70-15. These AR's were to be combined in a publication which will contain the equipment improvement process from Product Improvement Proposal thru modification or conversion of the equipments/spares involved. DARCOM was proponent on a shared (DRCRE and DRCPI) basis.

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Improvements in the Equipment Improvement Recommendation (EIR) Program

(U) Improvements to increase the effectiveness of the EIR program in both DARCOM and the field continued. To promote uniformity of reporting with all Governmental agencies/services and to greatly enhance ADP through the use of a standard form, the use of SF 368 in lieu of DA Form 2407 for reporting of EIR was proposed to HQDA. The proposal was approved on 22 July 1977. A complete revision for reporting of EIR in TM 38-750 and AR 750-1 was forwarded to the appropriate proponent office. To enhance the ADP program for Commodity Command Standard System (CCSS), this office, together with the appropriate Quality Assurance Office, redrafted cell 3E28 to provide that all reports received on SF 368 be input into a single program for consolidation, evaluation and resolution. This concept was also applied to cell 1W32 which will produce the appropriate reporting document to this headquarters. A greater statistical data base will now be available on field materiel failures and equipment improvement recommendations. A remaining immediate action underway was the complete revision of DARCOM (AMC) Regulation 750-3, Control of Equipment and Maintenance Improvement.

Red Team Analysis

(U) During the period, Red Team Analyses were conducted on 15 Systems. Three of these were done in conjunction with Disciplined Reviews. In addition to the scheduled reviews, special one time reports were made on the adequacy of training conducted for personnel responsible for the operation and maintenance of six systems. These encompassed TRADOC MOS school training and on-the-job training. The reports were provided to the major commands and TRADOC with recommendations where training would be improved. In addition to the above, 46 system assessments submitted by the Readiness Commands were reviewed for adequacy and comments were provided to DRCQA. The above reviews disclosed some systems to have one or more shortcomings in logistic support which would contribute to degraded readiness. These included inadequacies in maintenance and supply manuals, shortfalls in quantity and quality of MOS trained personnel to operate and maintain the systems, shortages in tools and test equipment or the need for product improvement of certain components. Recommendations regarding these deficiencies were provided to Readiness Commanders, and follow-up on improvement actions was being monitored through USAMMC.

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CHAPTER V PROCUREMENT AND PRODUCTION

Introduction

(U) During FY 1977, the Director of Procurement and Production had as his mission the direction and control of the DARCOM materiel development management activities pertaining to procurement and management for all Procurement Appropriations, Army (PAA).¹

(U) Another part of the mission was to direct and control the planning and execution of the DARCOM procurement and production mission which included the development and implementation of plans, policy programs, and procedures relating to DARCOM procurement and production management.

(U) The Director of Procurement and Production served as the program director for production base support, central procurement activities, industrial preparedness programs, and PAA programs. Also, he supervised the planning, programing, budgeting, and execution of such programs by the major subordinate commands, and defended applicable programs to higher authority. Further, the Director exercised operating control over the US Army Production Equipment Agency (PEQUA) and the US Army Procurement Research Office (PRO). Other parts of the mission were to implement the DOD Selected Acquisition Information and Management System (SAIMS) and its subsystems (less Selected Acquisition Reports), and to direct the Mobilization Designee (MOBDES) Program. He analyzed the requirements for MOBDES positions and developed the directorate Mobilization Table of Distribution and Allowances.

Procurement

Four Step Source Selection

(U) Over the years, the implementation of the DOD source selection and competitive negotiation techniques for major weapon systems was severely criticized. Contracting officers were required to discuss with the offeror a reasonable chance to win the competition. In practice this resulted in a "leveling" of the technical approaches among competitors to the point where it became difficult to distinguish which one is superior. As a result, the contracting officer developed a tendency to rely on proposed future cost more than was appropriate (considering their uncertainty) in selecting the winning contractor..

1. DARCOM-R 10-2, Organization and Functions, April 1976.

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(U) An Ad Hoc Group of the Service Under Secretaries devised a concept which does two things. Firstly, it limited the extent of discussions so that discussions were held only when (1) the meaning of the proposal was not clear, (2) the proposal was not adequately substantiated, or (3) further clarification of the solicitation was required for effective competition. Secondly, the concept established a four-step process for the selection of sources and the negotiation of a contract with the winner. These steps included the receipt and discussion of technical proposals, the evaluation of the combined proposals and selection of the winner, and the negotiation of the contract with the winner.

(U) During the past year, this concept, known as the Four-Step Source Selection Procedure, was employed on seven advanced development and engineering development procurements as seen in Chart 13.

(U) An initial evaluation of the test phase indicates mixed reactions to the effectiveness of the four step procedure. In instances including relatively small procurements, it added to the administrative lead time prior to award. However, it appeared to offer a better basis for Government/Industry mutual understanding, especially in the technical areas and on large procurements. An ODDR&E Working Group was evaluating the test results and was expected to issue changes to DODD 4105.62 based on its assessment.

Computerizing the Army's Procurement/Pricing Function (COPPER IMPACT)

(U) In an effort to find ways to improve the Army's pricing capabilities, DARCOM Pricing Office assessed an Air Force project, tabbed COPPER IMPACT, (COPPER meaning Procurement and IMPACT was the acronym for Improved Modern Pricing & Costing Techniques) which applied the General Electric Mark III time-sharing computer technology to the pricing process. It was determined that time-sharing computer technology could provide the Army's pricing function an effective vehicle in reducing pricing administrative and mechanical tasks to a minimum and thereby provide the much needed time for analytical evaluation of pricing data in support of contract negotiations.

(U) On the basis of the preliminary reviews, a decision was made at the January 1977 Procurement and Production Conference to proceed with implementation of COPPER IMPACT to the Army's Procurement/Pricing process.

(U) Implementation of the DARCOM procurement objective was initiated in July 1977 with the installation of three General Electric TerminiNet 300 terminals at Huntsville, Alabama; Warren,

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FOUR STEP SOURCES SELECTION PROCUREMENTS

| COMMAND | ITEM | CONTRACT VALUE (000's \$) | RFP/RFQ RELEASE DATE | DUE DATE FOR TECH PROPOSAL | DUE DATE FOR COST PROPOSAL | AWARD DATE |
|----------|---|------------------------------|-------------------------|-------------------------------|-------------------------------|---------------|
| ARMCOM | Squad Automatic Weapon | \$ 1,050 | 28 Jun 76 | 3 Aug 76 | 12 Oct 76 | 28 Jan 77 |
| ARMCOM | Soft Ring Airfoil Grenade (SOFTTRAG) | 350 | 6 Apr 76 | 18 May 76 | 23 Jun 76 | 19 Oct 76 |
| ARMCOM | DIVAD Gun | 120,000 | 26 Apr 77 | 6 Jul 77 | 16 Aug 77 | 2 Dec 77 |
| AVSCOM | 800 HP Advanced Technology Demonstrator Engine | 21,270 | 18 Jun 76 | 17 Aug 76 | 20 Sep 76 | 28 Jan 77 |
| MICOM | 2.75" Lightweight Rocket Launcher | 1,200 | 31 Mar 76 | 7 May 76 | 18 Jun 76 | 29 Sep 76 |
| MERADCOM | FLIR Sensor for RPV | 151 | 14 May 76 | 14 Jun 76 | 9 Jul 76 | 1 Sep 76 |
| MERADCOM | 3KW Inverter for Fuel Cell | 194 | 18 May 76 | 18 Jun 76 | 19 Jul 76 | 27 Oct 76 |

Chart 13

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Michigan; and Rock Island, Illinois. Due to the close proximity of the pricing function at the Development and Readiness Commands and the availability of two IBM terminals at St. Louis, Missouri, the capability of time-shared computer technology was extended to seven of our major procurement activities.

(U) Personnel from these seven major procurement activities attended the Air Force training courses (Lowry AFB, CO) in both computer programming and computer application techniques. To date, a total of 11 personnel were trained during June through August time-frame. In addition, training courses (no cost to the Government) were conducted by General Electric at the major subordinate commands.

(U) Current planning, as a result of June Procurement and Production Conference, contemplates adopting time-shared computer technology to the remaining subordinate commands and the Army's three (possibly four) plant activities in FY 1978.

Commercial Industrial Type Activities

(U) Prior to the Ford Administration leaving office, the Office of Management and Budget began pushing efforts to contract-out work historically accomplished in-house by Government civil servants and military personnel. The tenets to avoid the Government performing services and providing products when industry had or could develop such capabilities at cost savings were contained in OMB Circular A-76, entitled "Policies for Acquiring Commercial or Industrial Products and Services for Government Use."

(U) The management philosophy contained in the OMB Circular A-76 has been published in one form or another for nearly twenty years but was never applied too strenuously. During 1977 Government Agencies were directed to immediately comply with OMB Circular A-76, and consequently much effort was expended by DARCOM Headquarters and its Major Subordinate Commands in attempting to comply.

(U) Strict adherence to OMB Circular A-76 meant DARCOM would have to realign much of its management philosophy and organizational structure. The potential of thousands of lay-offs of DARCOM civilian work force and the reassignment of DARCOM military positions became substantial.

(U) As pressure mounted DOD, DA, and DARCOM, began to develop and assist in development of instructions and procedures necessary to comply with the new emphasis on OMB Circular A-76.

(U) Industry began lobbying for the chance to gain more government contracts. The General Accounting Office and the Office of

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Management and Budget began having serious differences on how to accurately compare contracting-out versus in-house government efforts. In the meantime the Unions representing government workers formed a powerful lobby resisting all contracting-out efforts and insisting on cessation of contracting-out until OMB and DOD performed further cost comparison studies hoping to prove government's control of its own support services was actually less expensive than contracting-out.

(U) The entire subject became a major issue in Washington during 1977, and as the new Carter Administration began to take over, certain compromises began to appear. As a result, the FY 1978 Appropriations Act was amended to delay contracting-out until OMB and DOD performed additional studies. The Act strictly prohibited certain types of efforts from being contracted-out until OMB and DOD performed additional studies. Also, the Act strictly prohibited certain types of efforts from being contracted-out during FY 1978 and provided specific limitations for services remaining susceptible to contracting-out.

Procurement Performance

(U) The performance for the end of FY 1977 in price competition, formal advertising, and small business awards were both rewarding and disappointing.² Seventy percent met their targets for formal advertising and only 50 percent of the MSCs reached the assigned targets for small business. Total DARCOM performance was considered satisfactory with formal advertising objectives being exceeded and price competition and small business targets being missed by approximately five percent and ten percent, respectively. However, it was noted that the outstanding performance of TARCOM with its high dollar volume was the principle contributor to the success achieved. The performance of AVSCOM, MIRCOM, and TROSCOM in the price competition area as well as TROSCOM's performance in the formal advertising field was noteworthy.

(U) Summarized below are the Army and DARCOM Procurement performance results since FY 1974:

| | Price Competition (Percent of Total Procurement Dollars) | | | | |
|--------|---|--------------|--------------|----------------------|----------------------|
| | <u>FY 74</u> | <u>FY 75</u> | <u>FY 76</u> | <u>FY 76 - FY 7T</u> | <u>FY 77 (12 Mo)</u> |
| Army | 33.5 | 41.8 | 39.1 | 39.4 | 34.1 |
| DARCOM | 28.1 | 31.7 | 29.6 | 30.7 | 25.8 |

² Ltr, DRCPP-SO, dated 5 Dec 77, subj: DARCOM Procurement Performance, 1 Oct 76-30 Sep 77 (FY 77).

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COMPETITIVE VS NON-COMPETITIVE PROCUREMENT 1 Oct 76 - 30 Sep 77
\$1.00 AND OVER (IN THOUSANDS) - EXCLUDES INTRAGOVERNMENTAL & FMS

| REPORTING COM'D OR ACTIVITY | Total Value Awards | PRICE COMPETITION | | | | | NON-COMPETITIVE | | | |
|-----------------------------------|--------------------------|-----------------------------|---------------------------|--------------------------|---------------------------|----------------------|---------------------------|-----------------|----------------------------|-----------------|
| | | /2-Step Formal Adv'tg | Other Formal Adv'tg | Negot Price Compet | Total/ Price Compet | % Price Compet | /Design | Follow-on | After: | Other Compet |
| | | | | | | | Tech'l Other Compet | Price Compet | Design Techn'l Other | |
| ARRCOM | 1,336,870 | -174 | 138,784 | 237,914 | 376,524 | 28.2 | 98,722 | 13,170 | 13,833 | 834,621 |
| ARRADCOM | 203,601 | 16 | 4,410 | 10,370 | 14,796 | 7.2 | 6,260 | 10,034 | 9,134 | 163,377 |
| AVSCOM | 801,002 | - | 24,340 | 115,225 | 139,565 | 17.4 | 130,447 | 442 | 77,967 | 452,581 |
| ECOM | 711,424 | 3,329 | 17,307 | 82,180 | 102,816 | 14.5 | 162,893 | 14,550 | 18,213 | 412,952 |
| MIRCOM | 620,773 | 1,226 | 3,799 | 162,361 | 167,386 | 27.0 | 3,396 | 3,324 | 112,766 | 333,901 |
| MIRADCOM | 446,937 | - | - | 334 | 334 | 0.1 | 23,034 | 10,155 | 222,622 | 190,792 |
| TARCOM | 1,497,381 | 80,615 | 348,161 | 204,433 | 633,209 | 42.3 | 2,374 | 2,653 | 6,805 | 852,340 |
| TARADCOM | 238,695 | - | 13,110 | 662 | 13,772 | 5.8 | 124,841 | 121 | 29,046 | 70,915 |
| TECOM | 82,788 | 1,625 | 6,157 | 21,846 | 29,628 | 35.8 | 19,663 | 136 | 430 | 32,931 |
| TROSCOM | 134,512 | - | 51,877 | 33,255 | 85,132 | 63.3 | 1,040 | 250 | 182 | 47,908 |
| MERADCOM | 108,463 | - | 82 | 10,144 | 10,226 | 9.4 | 24,695 | 1,648 | 31,066 | 40,828 |
| NARADCOM | 11,442 | - | 276 | 2,777 | 3,053 | 26.7 | 1,633 | - | 72 | 6,684 |
| OTHER | 260,077 | 907 | 18,972 | 74,900 | 94,779 | 36.4 | 13,300 | 222 | 9,229 | 142,547 |
| AVRADCOM | 18,985 | - | - | - | - | - | 2,027 | - | -161 | 17,119 |
| DARCOM | 6,472,950 | 87,544 | 627,275 | 956,401 | 1,671,220 | 25.8 | 614,325 | 56,705 | 531,204 | 3,599,496 |

Chart 14

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PERFORMANCE AGAINST ASSIGNED TARGETS BY COMMAND/ACTIVITY
ALL CATEGORIES OF FUNDS - EXCLUDES INTRAGOVERNMENTAL & FMS

1 Oct 76 - 30 Sep 77

| REPORTING OR REQUIRING COMMAND | Price (1) Competition (%) | | Formal (1) Advertising (%) | |
|-----------------------------------|------------------------------|---------------|-------------------------------|---------------|
| | FY 77 Actual | FY 77 TARGETS | FY 77 Actual | FY 77 TARGETS |
| ARRCOM ARRADCOM | 28.2 7.2 | 35.0 - | 10.4 2.2 | 10.5 - |
| AVSCOM | 17.4 | 8.0 | 3.0 | 3.0 |
| ECOM | 14.5 | 14.0 | 2.9 | 2.0 |
| MIRCOM MIRADCOM | 27.0 0.1 | 22.0 - | 0.8 0.0 | 2.0 - |
| (TARCOM (TARADCOM | 42.3 5.8 | 29.0 0.5 | 28.6 5.5 | 19.0 1.0 |
| TECOM | 35.8 | 25.0 | 9.4 | 6.0 |
| TROSCOM | 63.3 | 54.0 | 38.6 | 19.0 |
| MERADCOM | 9.4 | 8.0 | 0.1 | 2.0 |
| NARADCOM | 26.7 | 34.0 | 2.4 | 10.0 |
| OTHER | 36.4 | - | 7.6 | - |
| DARCOM | 25.8 | 27.0 | 11.0 | 9.5 |

Note: (1) Based on Procurement Actions \$1.00 and over (DD 350 & DD 1057) reported by the activity and its subordinate purchasing offices, if any.

Chart 15

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SMALL BUSINESS PROGRAM
ARMY MATERIEL DEVELOPMENT & READINESS COMMAND

FISCAL YEAR

Period 1 Oct 76 - 30 Sep 77

(Dollars in Thousands)

| <u>Total Procurement Awards to Business Firms</u> | | | | |
|---|---------------------------------|--------------------------------|----------------------|------------|
| COMMAND | TOTAL ALL BUS AWARDS (\$) | TOTAL SM BUS AWARDS (\$) | PERCENTAGE ACTUAL | TARGET (%) |
| ARRCOM | 1,320,911 | 297,748 | 22.5 | 22.0 |
| ARRADCOM | 199,353 | 17,659 | 8.8 | - |
| AVSCOM | 798,919 | 45,929 | 5.7 | 7.0 |
| ECOM | 685,508 | 130,386 | 19.0 | 21.0 |
| MIRCOM | 613,925 | 72,302 | 11.8 | 9.0 |
| MIRADCOM | 437,127 | 18,623 | 4.3 | - |
| TARCOM | 1,484,943 | 213,140 | 14.4 | 15.0 |
| TARADCOM | 237,642 | 1,758 | 0.7 | 2.0 |
| TECOM | 77,107 | 37,634 | 48.8 | 42.0 |
| TROSCOM | 123,507 | 61,700 | 50.0 | 54.0 |
| MERADCOM | 103,418 | 26,768 | 25.9 | 16.0 |
| NARADCOM | 10,338 | 7,512 | 47.5 | 35.0 |
| OTHER | 245,598 | 102,383 | 41.7 | 40.0 |
| AVRADCOM | 17,155 | 63 | 0.4 | - |
| DARCOM | 6,355,451 | 1,030,999 | 16.2 | 18.2 |

Chart 16

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Formal Advertising (Percent of Total Procurement Dollars)

| | <u>FY 74</u> | <u>FY 75</u> | <u>FY 76</u> | <u>FY 76-FY 7T</u> | <u>FY 77 (12 Mo.)</u> |
|--------|--------------|--------------|--------------|--------------------|-----------------------|
| Army | 12.5 | 16.9 | 16.2 | 15.2 | 14.4 |
| DARCOM | 9.7 | 10.6 | 10.9 | 14.0 | 11.0 |

Small Business (Percent of Total Procurement Dollars)

| | | | | | |
|--------|------|------|------|------|------|
| Army | 26.0 | 26.9 | 27.1 | 27.4 | 22.5 |
| DARCOM | 17.5 | 18.1 | 17.9 | 17.9 | 16.2 |

(U) The following three charts reflect the actual performance for the period by major subordinate commands and other purchasing activities against FY 1977 goals.

PROMS Improves P&P Management

(U) The Procurement and Production Directorate initiated in March 1976 the DARCOM Procurement Management System (PROMS), and completing in July full integration of the system into procurement management. PROMS, as a management system for planning and control, outlined procedures for the development of objectives and measurement of performance against objectives. It was created to counter certain problems that had arisen. Three factors combined to produce doubts about the directorate's future effectiveness.³ First, a reduction in resources not accompanied by a reduction in the procurement workload. Second, the command changed philosophy from that of centralized to decentralized management. Third, the procurement community was under the increased scrutiny of Congress as the public became more and more interested in the particulars of government procurement.

(U) In response, directorate personnel agreed to examination by an outside group that might provide solutions to the above problems. They asked the Army Procurement Research Office (APRO), an element of the US Army Logistics Management Center at Fort Lee, Virginia to study their management system and to recommend ways in which to improve it and the organization

³ ARMY LOGISTICIAN, November-December 1976 by Robert F. Williams and Captain Robert J. Walker.

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(U) APRO confirmed many of the suspected problems in the existing system and pointed out some distinct improvements that might be made. The sum of these improvements was the development of PROMS.

(U) During FY 1977, the FY 1978 Objectives were developed, initiated with a request for proposed objectives from the subordinate commands. In developing objective statements and subsequently the associated tasks and targets, action officers at HQ worked with action officers at the commands. The objectives were further discussed and approved by the Directors at P&P Directors' Conferences.⁴ This system, affording maximum participation of DARCOM procurement managers, has resulted in more accurate performance measurements and realistic controls.

(U) Concurrent with the development of next year's objectives, action officers reviewed performance against the FY 1977 objectives. Following the end of each quarter, a consolidated review was prepared summarizing commands' performance during that quarter against the objectives. When targets were not achieved causes were analyzed and corrective actions were taken as necessary. The quarterly review provided the Director of P&P timely management information, revealing trends through the year and comparisons to the prior year's performance.

Should Cost Program

(U) Application of the Should Cost technique to major sole source procurements continued to be an effective tool in evaluating and developing supportable government objectives for contract negotiations. Should Cost results were still running eight to nine

⁴ Milestone dates and details of the planning cycle are contained in DARCOM P715-12, The DARCOM Procurement Management System (PROMS) Guide.

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percent (total savings - 15 percent) over reductions normally achieved under the traditional methods of contract negotiations. Streamline or follow-on Should Cost studies were still resulting in overall price reductions of eight percent.

(U) Commands, through 3d Quarter, have completed eight studies (2 streamline) against a DARCOM goal of 16 studies. The results follow: Proposed Cost - \$1,060 million, Negotiated Cost - \$917 million, Reductions - \$143 million, and Should Cost - \$91 million.

Secretarial Determination and Findings (D&F)

(U) The Office of the Assistant for Policy of the Directorate for Procurement and Production, during FY 1977, received and staffed for Secretarial Approval, 280 RDT&E D&F's under 10USC2304(a)(11), having an estimated value of \$1,592,286,505 and 33 Procurement Appropriation D&F's 10USC2304(a)(13); (14) and (16) having an estimated value of \$3,191,613,052.

Procurement Management Review

Major Mission Accomplishments

(U) Consecutive contract management reviews were scheduled and performed, of the three active Army ammunition plants (Scranton, Louisiana, and Holston), and two of the inactive plants (St. Louis and Gateway) as an aid to ARRCOM, which assumed jurisdiction from ARMCOM on 1 February 1977. A total of 94 recommendations and 39 suggestions for changes to improve efficiency and effectiveness resulted from the combined reviews. The most significant of the topics addressed, generally common to all plants, covered the need to revise mission and function statements of Plant Commanders/COR Staffs; handling of progress payments; contractor's accounting, estimating, and procurement systems; rental charges for contractor use of government facilities for non-government business; contract funding and line item accounting.

(U) At the direction of the Assistant Secretary of the Army (I&L), a feasibility study was conducted to determine which of several alternative PMR recommendations for improving procurement operations of the Army's Korean Procurement Agency (KPA) was most appropriate and offered the greatest potential for success. Also, a special team was dispatched to Korea to conduct on-site briefings and provide on-site instructions to KPA personnel in the implementation of improved procurement management and operations methods and techniques.

(U) The concept of controlled Single Source Solicitation Procedure (CSSSP) for use in Korea was developed and approved by the OSA.

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Two subsequent trips to Korea were required to develop and implement definitive CSSSP operating procedures on-site, and to monitor progress and establish a requirement for periodic progress reporting. In the first quarterly report on use of the CSSSP, the Deputy Commander USFK stated that the new procedure was accomplishing its intended purpose.

(U) A special briefing was conducted for AVSCOM's Director, Procurement and Production, and Staff to summarize results of PMR's of the three plant activities under AVSCOM cognizance (Bell, Hughes, and Boeing), now AVRADCOM. The briefing focused on the team's 49 recommendations and 45 suggestions resulting from the combined reviews.

(U) Performed procurement management reviews of 10 activities of the US Army Europe including USAREUR, USAPAE, APO Fuerth, APO Seckenheim, APO Stuttgart, NATO/SHAPE Support Group-Brussels, US Army Berlin Brigade, USA SETAF, US Army Communications Command-Worms, Corps of Engineers. Report of those reviews was in preparation.

(U) At the direction of the ASA (I&L), a separate special review of off-shore procurement problems associated with Host Nation Support of US Forces Europe was conducted. Results of the review, with recommendations, were furnished to the ASA (RD&A) by memorandum.

Other Mission Accomplishments

(U) Minor yet significant acts performed included a special consultative type procurement management review, requested by the Commander, US Army Security Agency Materiel Support Command (USASAMSC), Vint Hill Farms Station, Warrenton, Virginia. A review report was developed and distributed giving an overview of procurement operations of USASAMSC at the time of its transfer from the US Army Security Agency (USASA) to DARCOM. It highlighted 10 recommendations and 14 suggestions for actions needed to improve procurement operations.

(U) At the direction of DOD, DARCOM performed a review of management of the Commercial or Industrial Type Activity (CITA) Program within the Army. Three installations, each representative of a different major Army Command, were reviewed on-site to provide the base data for a cross section analysis of Army responsiveness to the objectives, policy and procedural guidance set forth in OMB Circular A 76; and from a procurement view, an analysis of difficulties perceived, corrective action recommended, adequacy of documentation for audit (trackability), uniformity of reporting, quality of procurement data packages, impact of procurement decisions, evidence of cost growth or other adverse developments.

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(U) Assistance was provided in relocating approximately 20 procurement careerists displaced as a result of reorganizations and realignments within HQ DARCOM and its major subordinate commands during FY 1977. The same service is currently being provided to approximately 40 others in the same category.

(U) Guidance and assistance was given to DARCOM installations in maintaining TDA positions for graduating DARCOM procurement interns (e.g. Sacramento Army Depot); and identified permanent duty location assignments for approximately 100 interns six months prior to the end of the second year of their training. Also, directorate level review was performed of nine subordinate command TDA's submitted for approval in connection with reorganizations resulting from the AMARC Study. TDA's were examined for functional propriety and organizational integrity from a procurement management viewpoint.

(U) Fiscal Year 1977 has been a woeful year for the Office of the Special Assistant for Small Business both as to personnel turbulence and meeting assigned quantitative goals.

(U) Personnel turmoil was also experienced at major subordinate commands addressing the various programs monitored by the Office of Special Assistant for Small Business. As the result of the reorganization stemming from the AMARC Study and personnel reductions imposed by higher authority, the effectiveness and posture of operating field Small Business Offices was generally diluted while program emphasis was increased as the result of actions by Congress, the President, DOD and higher headquarters.

(U) Splitting responsibility between Materiel Readiness Commands and Development Commands, generally resulted in decreasing the resources previously assigned to major commodity commands. Acute shortages of resources at both research and readiness command structures appeared to adversely affect the award to Small Business Program and Advance Planning Procurement Information Program in particular. In addition, the Chief of Small Business Office's at Development Commands was reduced from the GS-14 to GS-13 level--this being the area where small business and minority enterprise business required the greatest effort. The effectiveness of the field offices where commands were collocated was further exacerbated as one small business office was assigned to effect action for both masters. This was particularly acute in that the modus operandi, goals and objectives, and disciplines vary greatly and the Small Business Advisor was required to be on the Staff of the Commanding General.

(U) There were three programs that had quantitative targets for all DARCOM activities as well as for headquarters and the Army. These were: percentage of dollars awarded to small business, percentage of

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small business set-asides, and dollars awarded under the Section 8(a) contracting program.

(U) Percentage of Dollars Awarded to Small Business. Historically, this had been our most salient goal--securing the most attention from DA, DOD, and Congress. The Army continued to out-perform the Navy and Air Force in this program. Only the Defense Logistics Agency surpassed the Army within the Department of Defense. It was noted, however, that for the first time in seven years, DARCOM did not meet its goals in FY 1977. Goals for DARCOM overall increased from 12 percent in FY 1969 to 18.2 percent in FY 1977. Performance of DARCOM was 15.2 percent in FY 1977.

(U) Percentage of Small Business Set-Aside. As a result of Congressional concern, specific goals for this program were imposed upon DARCOM by the Army in FY 1977. In this area, DARCOM surpassed its assigned target 4.3 percent in FY 1977, accomplishing 5.7 percent of dollars awarded through set-aside actions.

(U) Dollar Awarded under the Section 8(a) Contracting Program. This involved awarding contracts to minority business enterprises through the Small Business Administration. Starting in FY 1977, specific dollar goals were established and imposed by DOD on the Army and subsequently on DARCOM. This was the program that the Army, with DARCOM providing approximately 50 percent of the dollars, excelled over all federal agencies in the Government. Notwithstanding this record, Secretary Alexander directed us to improve our posture, establish tighter reporting controls, and in the fourth quarter increased our target from \$49 million to \$54 million in FY 1977. Final total dollars awarded to DARCOM was \$57.1 million or 106 percent of our revised goal.

(U) Although not quantitatively targeted, other programs of prime concern to the Small Business Offices included the advance planning procurement information program, the small business and labor surplus area set-aside programs, the small business subcontracting and minority business subcontracting programs, and the breakout programs.

(U) Advance Planning Procurement Information Program. This was a Department of Army program requiring HPA's to appoint Army/Industry Materiel Information Liaison Officers (AIMILO). They were responsible for making available to industry all advance planning procurement information on a continuous direct contact basis, and at the earliest practicable time in the planning cycle. Sadly, this program was implemented to any extent by only two of our major subordinate commands.

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Some AIMILO's were located in the Procurement Directorates while others were in the Small Business Office. From the inference in The Army Procurement Procedure, the program should probably have been the responsibility of the Small Business Office. This program appeared to suffer from lack of personnel resources.

(U) Small Business and Labor Surplus Area Set-Aside Programs. The President signed Public Law 95-89 which directly impacted on procurements and will result in establishing first priority for set-asides to Small Business concerns in labor surplus areas. This law also gave greater authority to the Small Business Administration in making decisions normally reserved for DARCOM Contracting Officers: e.g., determining the responsibility of small business to secure an award as well as determinations addressing eligibility under the Walsh-Healy Act. This increased authority of the Small Business Administration at the expense of DARCOM contracting officers may have been of DOD's own making.

(U) Small Business Subcontracting and Minority Business Subcontracting Programs. Because of lack of resources and the question of privity of contract, it appeared as if these programs had been given limited attention. Normally, the Administating Contracting Officer shouldered most of the responsibility. However, increased attention and reporting procedures were generated by DOD based on the concern of Congress--particularly related to the Minority Business Subcontracting Program.

(U) Breakout Programs. Marginal attention was directed in this area by Procurement, Engineering, and Small Business Offices. Lack of resources and top management attention was probably the reason. This should have been a major program, especially in the research and development command structure.

Industrial Base

Reorganization

(U) The Industrial Management Division, with its three branches, was disestablished and in its place the Associate Director for Industrial Base (AD/IB) was established as a single cell organization, with 31 people reporting directly to the Associate Director. Also, the functions of Production Base Support (PBS) budget formulation and execution, and Industrial Preparedness Operations (IPO) technical direction, formerly assigned to the Industrial Management Division, were transferred to the Associate Director for Programs.

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(U) As a result of the single cell organization, a span of control problem developed within the AD/IB which prompted the establishment of a functional team structure. It also became apparent that the management of the Production Base Support and Industrial Preparedness Operations programs were no longer functioning smoothly. There was a defacto overlap in functions, particularly in the budget preparation and execution functions, which resulted in confusion and inefficiency. This was evidenced by complaints from the DA staff and subordinate commanders, as well as internal DARCOM complaints. The confusion caused by the functional realignment was also surfaced by the DAIG Manpower Survey. These conditions prompted the Director, Procurement and Production to direct a resolution of the problem by the Associate Director for Programs and Industrial Base.

(U) In early January, the Director, the two Associate Directors, and the Deputy Director, Personnel Training and Force Development (PT/FD) discussed the issues. At the meeting, it was determined that the span of control problem could be alleviated by modification of Team Leader job descriptions to add supervisory duties, including preparation of performance appraisals.

(U) On the issue of realignment of PBS and IPO functions, it was determined that an internal realignment could be made at the discretion of the Director. In view of the recency of the DARCOM reorganization, such a realignment was to be approached with caution, and the following guidelines were established.

(U) The redistribution of functions would retain the integrity of the separation of program execution from program development and technical management.

(U) The redistribution of functions would be accommodated by the realignment of personnel staffing where clearly indicated. Any movement of personnel would adhere to the principle that when a function was moved, the person performing the function moved with it. Also, Table of Distribution and Allowances (TDA) change would be required to move personnel and functions between offices of Associate Directors. Prior to initiation of any action to move positions or change job descriptions, the action would first be discussed with the Civilian Personnel Office (CPO) to insure that it was legal and prudent.

(U) Consistent with the above guidelines, a course of action was approved. Control of PBS program release would remain in the Office of the Associate Director for Programs consistent with all other Army Procurement Appropriation (APA) Programs. As part of the total APA program, fiscal execution of the PBS program would be controlled by the Associate Director for Programs. Supplemental controls

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unique to the PBS portion of the APA program would be imposed, as required, and would be efficiently tracked by the Associate Director for Industrial Base without jeopardizing the integrity of fiscal control. Finally, current job descriptions in both offices were aligned to this course of action. Only minor changes were required to correct terminology, and these changes would have been required irrespective of selected course of action.

(U) Changes in the TDA allowed three spaces, with incumbents, to be moved to the Office of the Associate Director for Industrial Base. A change to DARCOM-R 10-2 was processed to realign the PBS and IPO related missions. Further, four functional work groups were established under supervisory group leaders, with the function generally classified as Industrial Preparedness Plans & Policy; Industrial Base Operations; Industrial Base Facilities Management; and Industrial Base Program and Budget.

OMA 728011.0 Management Upgrade

(U) A number of actions were in progress in fiscal 1977 to upgrade the management of OMA 728011.0, Industrial Preparedness Operations. One of these was the development of a proposed revision to the chart of accounts for this Program Element (PE). In addition to redefining the accounts, the number of workload performance factors was increased from the current 30 to 65 in the proposed revision. The Deputy Director of Procurement and Production signed the letter on May 1977 transmitting the revised chart of accounts to HQDA for approval. On 26 September 1977, DCSRDA completed its review of the proposed revision and stated in Comment No. 1 to DCSLOG: "The proposal provides a significant improvement over the previous account definitions in that a basis for better, more thorough justification of required program is established. The level of detail provided by the revised performance factors is consistent with the type of information required of DARCOM for defense of the 728011 account to OSD/OMB and Congress." ODSRDA recommended to DCSLOG that action be taken to incorporate the proposed revision into AR 37-100-78, The Army Management Structure.

(U) Fiscal Year 1977 saw the development of draft project formats for OMA 728011.0 similar to those used to justify the Production Base Program. These formats are intended to provide a location by location detailed justification for OMA 728011 funds utilizing the performance factors in the revised chart of accounts. Separate project formats were devised for (i) maintenance of laid away reserve industrial plants or laid away portions of plants, (ii) maintenance of idle reserve industrial equipment located at contractor-owned, contractor-operated (COCO) plants and at Army-controlled storage sites as well as requirements for rebuilding industrial plant equipment (IPE), and (iii) performing the various functions incorporated under

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the heading of Industrial Preparedness Planning. Preliminary versions of these project formats were sent in July 1977 to the Major Subordinate Commands (MSC) for comment. The finalized versions of the project formats were to be sent to the MSC's by November 1977 with instructions that they were to be completed for justification of the FY 1979/ FY 1980 Command Operating Budget Estimate (COBE) for OMA 728011.0 due in DA by July 1978.

(U) Important innovations in program management for laid away elements of the production base were initiated by ARRCOM in Fiscal Year 1977. These included an OMA reporting and control system providing concise, easily accessible reference of laid away facilities at the government-owned, contractor-operated (GOCO) plants. The system consisted of two parts, (i) a catalog of laid away production lines/areas and support facilities in the GOCO complex, and (ii) a network analysis of the startup of these laid away facilities. Data in the catalog was to include current condition, histories of maintenance funding, ability to respond, projected condition over the next five years, and equipment voids. A test of the system was to be conducted in October 1977, and the system was to be completed and operable by October 1978.

(U) GOCO Reactivation Network Analysis. This technique identified the steps necessary to reactivate a production line and/or support facility with the time required to accomplish the reactivation, and the associated probability of achieving a successful reactivation. Through the use of the Venture Evaluation and Review Technique (VERT) program developed at ARRCOM, a statistical distribution of the time to reach critical events in the startup process will be obtained and the critical path and "choke points" identified. Having identified those events and activities which had the potential to adversely affect startup, ARRCOM will be able, if appropriate, to allocate OMA funding to upgrade selected equipment or facilities to minimize the slowdown. In essence, ARRCOM will have a technique which tells if a laid away production facility can produce a product in the timeframe and quantity necessary to meet mobilization schedules. Through annual verification, a measure of readiness for the industrial base will be maintained. This concept was proven out since "dummy" networks had actually been run through the VERT computer program. Program modifications were in process to improve upon program use.

(U) ARRCOM funded 16 GOCO plants which will provide approximately 60 networks. This initial phase was limited to those laid away facilities which provided ammunition for the M109 Self-Propelled Howitzer. Preparation of the networks was expected to take four to five months. Cost estimates to develop reactivation networks for the balance of all laid away lines/areas at the GOCO's were requested, and response was due during November 1977.

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(U) During Fiscal 1978 ARRCOM will develop the approach to be taken for the GOCO's and COCO's and how this technique can be used for active line acceleration and surge production.

(U) Plant Equipment Package Management Information System Data Base (PEPMIS). The purpose of PEPMIS was to establish a centrally managed data base for Plant Equipment Packages (PEP's) that would provide information required to evaluate the production capability of a PEP.

(U) PEPMIS was structured to be a centrally managed data base for all industrial plant equipment, other plant equipment, special tooling, and special test equipment required to be retained in order to meet the mobilization schedule specified in the production base plan. This data base will enable PEP managers to (1) optimally allocate the production base equipment and special tooling, (2) identify equipment candidates for acquisition, rehabilitation, or replacement, (3) assess the impact mobilization requirement changes have on equipment assets and (4) assess the PEP's capability of achieving the mobilization requirement.

(U) This system will interface with the OMA reporting and control system and will be utilized when performing Army Readiness Management System (ARMS) analyses. Thus, it will allow more effective management of the industrial base by giving the manager a clearer picture of equipment needs and ARRCOM's ability to respond to production demands. An operating system was projected to be completed by September 1978.

(U) The Army Readiness Management System (ARMS). ARMS was a technique developed by ARRCOM to assess the readiness of a total weapon system by analyzing the components of that system, i.e., weapon, ammunition and spare parts. It analyzed details of requirements, assets, and production base capability to identify the components that limited total system readiness. When a specific ARMS analysis was completed, it provided a basis for determining application of resources to improve system readiness.

(U) An ARMS analysis of the 7.62mm M60 Machine Gun Weapon System was completed in fiscal 1977. This analysis showed that currently there was no significant limitation to 100 percent readiness to meet the NATO Case 1 Scenario projected through D+12 months.

(U) Also initiated was an ARMS analysis of the 155mm M109 Self-Propelled Howitzer Weapon System. This analysis was much more complex than the M60 Machine Gun and a methodology was to be developed to accomplish the analysis using computer assistance where feasible.

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Forecast for completing initial analysis of this weapon system was January 1978. Areas for more in-depth analysis will be determined as a result of this initial review.

(U) Upon completion the M109 ARMS analysis will provide a technique for analyzing the 34 major weapon systems which ARRCOM manages. An approach will be developed during fiscal 1978 which will identify their apparent system readiness and this will enable ARRCOM to prioritize the total listing.

PEP Upgrade

(U) Significant steps were taken to upgrade industrial plant equipment (IPE) during the past year. To date, test and repair work was limited to critical equipment on active production lines at the following activities: Colt Industries (M16 rifle), Bowen-McLaughlin-York (M109/M110 SP Howitzer), US Army Tank Plant (M60 Tank), Stratford Army Engine Plant, Watervliet Arsenal (thickwall cannon tube) and Maremont Corp. (M60 machine gun).

(U) A DARCOM plan was being developed which will identify funds required to test and repair all the IPE in the 34 non-munition plant equipment packages (PEP's). The 8201 pieces of active and inactive IPE had an acquisition cost of approximately \$186 million and a replacement cost of about \$564 million. It was expected that approximately \$90 million will be required to repair the active and inactive IPE. Most of the equipment would not be capable of supporting sustained mobilization requirements without extensive repairs.

Program Control

(U) An organizational change in the control of the Production Base Support (PBS) budget was made to improve the overall fiscal management of the Production Base Support Program. Functional control of the Army Procurement Appropriation (APA), and Operation and Maintenance, Army (OMA) program element 728011 was transferred from DRCP-P to DRCP-I.

(U) The PBS program for FY 1977 follows:

| | <u>\$ Millions</u> |
|--|--------------------|
| Aircraft PBS | 11.8 |
| Tracked Combat Vehicles PBS | 72.5 |
| Missiles PBS | 8.9 |
| Weapons & Other Combat Vehicles PBS | 13.3 |
| Tactical Support Vehicles PBS | 2.1 |
| Communications & Electronics Equipment PBS | 16.7 |
| Other Support Equipment PBS | 17.4 |
| Sub-Total Non-Ammunition | 142.7 |
| PBS Program for Ammunition | 236.7 |
| Total FY 1977 PBS Program | <u>\$ 379.4</u> |

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Modernization of the Munitions Industrial Mobilization Base

(U) A contract, awarded to Kaiser Engineers in association with Stetter Associates to develop a plan for modernization of the Munition Base, was completed in FY 1977. The plan will be utilized to insure the ability to respond in emergencies and satisfy current safety and environmental standards while minimizing ammunition inventory to save costs. Generally the plan will be followed to avoid uncharted pitfalls in modernizing the ammunition production base.

Automation of Production Base Plan

(U) The review of Army Mobilization Planning which was completed in 1975, found planning to be restricted by massive data collection requirements and recommended automation of this collection effort. After completion of preliminary studies by Logistics Systems Support Agency (LSSA), ARRCOM and Industrial Base Engineering Agency (IBEA) were jointly tasked in July 1977 to complete final phase development of the plan. An In-Process Review held in October 1977 developed final milestones for completion of the plan in 1978.

Status of Army Reserve Industrial Plants

(U) During FY 1977, there were presently 48 Army-Owned Industrial Plants of which 34 were government-owned, contractor-operated (GOCO) and 15 were government-owned, government-operated (GOGO). The 15 GOGO's include McAlester and Hawthorne, which were transferred from the Navy to the Army on 1 October 1977. Of the 48 plants, 32 were active and 16 were inactive with Volunteer AAP and Frankford Arsenal being placed in the inactive status during this fiscal year.

Master Urgency List (MUL) Nominations

(U) The MUL is a DOD list approved by the Secretary of Defense based on recommendations of the Assistant Secretary of Defense for Installations and Logistics. It was issued as a guide for the purpose of expediting materials and production equipment for defense manpower. The list included the items and quantities of those items in the two highest urgency categories that required special attention. Normally this DOD list was resubmitted and rejustified annually. The highest priority rating is "DX" and the new lower rating is "DO".

(U) During the past year, extensive analysis and technical review of each MUL nomination were conducted with the submitting DARCOM activity. For the first time, a short informational summary was developed and provided with each nomination to preclude question by higher echelons.

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Surge Studies

(U) DARCOM was directed to accomplish a Surge Study for increased peacetime as well as mobilization production for the M109A2 Self-Propelled Howitzer. The study was to be completed by October 1977 but was extended to March 1978 as a result of difficulties in obtaining projected production capabilities for the XTG 411 transmission. ARRCOM was tasked to accomplish the study.

(U) DA also directed DARCOM to accomplish a Surge Study for the TOW Heavy Antitank/Assault Weapon System. The Project Manager for the TOW missile was tasked to accomplish this study. Completion date was scheduled for February 1978.

Programs

Procurement Program-Army Appropriations

(U) There have been significant increases in the overall dollar value of procurement programs during the last four years. The Army program particularly showed substantial growth during this period, from \$2.8 billion in FY 1974 to \$5.2 billion in FY 1977. Chart 17 depicts the growth of the released program, FY 1974-1977.

Procurement Appropriations Army (PAA)

(U) DARCOM established a dollar award objective of \$5,715.8 million which was adjusted (less non-actionable) to \$5,604.4 million for FY 1977. The overall award command performance exceeded the DARCOM objective by \$110.6 million for a performance of 102.0 percent. Chart 18 reflects the above accomplishment.

Cost Performance Reporting

Guidance

(U) During the year, guidance to DARCOM elements with respect to the implementation of the Selected Acquisition Information and Management Systems (SAIMS), except Selected Acquisition Reports, was consolidated and published in DARCOM Regulation 715-2. As the proponent of the Cost/Schedule Control Systems Criteria (C/SCSC) Joint Surveillance Guide, HQ DARCOM developed, coordinated and published Change 1 to that regulation. HQ DARCOM also took the lead in drafting a joint Guide "Cost/Schedule Management of Non-Major Contracts" concerning primarily the implementation of the DOD Cost/Schedule Status Report (C/SSR).

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**PROCUREMENT PROGRAM, ARMY APPROPRIATIONS

(DIRECT ARMY/REIMBURSABLES) RELEASED PROGRAM

M OF \$

| <u>COMMAND</u> | <u>FY 74</u> | <u>FY 75</u> | <u>(15 Mo Period) FY 76/77</u> | | <u>FY 77</u> |
|-------------------------|--------------|--------------|------------------------------------|-----------|--------------|
| ARRCOM | 1920.5 | 2413.2 | 2363.7 | *ARRCOM | 2034.2 |
| | | | | *ARRADCOM | 224.3 |
| AVSCOM | 253.6 | 351.9 | 560.9 | *TSARCOM | 649.2 |
| ECOM | 284.2 | 443.3 | 561.0 | *CERCOM | 759.7 |
| MICOM | 842.9 | 1649.7 | 1708.8 | *MIRCOM | 966.2 |
| | | | | *MIRADCOM | 79.4 |
| TACOM | 1278.4 | 1064.7 | 2225.8 | *TARCOM | 1853.1 |
| | | | | *TARADCOM | 125.2 |
| TROSCOM | 209.0 | 166.6 | 234.3 | *TSARCOM | 216.4 |
| OTHER | 96.8 | 51.0 | 145.4 | | 81.8 |
| TOTAL | 4885.4 | 6140.4 | 7799.5 | | 6989.5 |
| ARMY PROGRAM | 2805.0 | 2945.4 | 4604.5 | | 5162.4 |
| REIMBURSABLE PROGRAM | 2080.4 | 3195.0 | 3195.0 | | 1827.1 |

NOTE: * = REORGANIZATION OF DARCOM

** = SOURCE: 1369 REPORT

Chart 17

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DARCOM
STATUS OF AWARDS
FY 77 PEMA PROGRAM RCS CSGLD 1369 (R1)
AS OF 30 SEPTEMBER 1977
(\$ MILLIONS)
FY 75-FY 77

| | | RELEASED PROGRAM | AWARD OBJECTIVE | LESS-NON ACTIONABLE | ADJUSTED OBJECTIVE | AWARDS | % ACHIEVED ADJ OBJECTIVE | CARRY OVER |
|------------------------|-------|---------------------|--------------------|------------------------|-----------------------|--------|-----------------------------------|---------------|
| ARRCOM | DA | 1274.1 | 968.5 | -- | 968.5 | 1052.5 | 108.7 | 221.6 |
| | REIMB | 760.1 | 608.8 | -- | 608.8 | 650.8 | 106.9 | 109.3 |
| ARRADCOM | DA | 218.7 | 172.3 | 7.7 | 164.6 | 181.9 | 110.5 | 36.8 |
| | REIMB | 5.6 | 5.1 | -- | 5.1 | 3.7 | 72.5 | 1.9 |
| TSARCOM (AVSCOM) | DA | 572.2 | 460.4 | -- | 460.4 | 452.5 | 98.3 | 119.7 |
| | REIMB | 77.0 | 50.9 | -- | 50.9 | 55.1 | 108.3 | 21.9 |
| TERCOM (ECON) | DA | 694.4 | 498.9 | 22.8 | 476.1 | 463.0 | 97.2 | 231.4 |
| | REIMB | 65.3 | 40.8 | -- | 40.8 | 43.0 | 105.4 | 22.3 |
| MIRADCOM | DA | 41.3 | 29.6 | -- | 29.6 | 34.5 | 116.6 | 6.6 |
| | REIMB | 38.1 | 31.5 | -- | 31.5 | 31.9 | 101.3 | 6.2 |
| MIRCOM | DA | 527.6 | 508.6 | 15.0 | 493.6 | 478.0 | 96.8 | 49.6 |
| | REIMB | 438.6 | 364.6 | -- | 364.6 | 385.3 | 105.7 | 53.3 |
| TARCOM | DA | 1438.6 | 1270.7 | 47.1 | 1223.6 | 1230.1 | 100.5 | 208.5 |
| | REIMB | 411.5 | 330.4 | 4.7 | 325.7 | 349.2 | 107.2 | 65.3 |
| TARADCOM | DA | 123.0 | 123.0 | 14.1 | 108.9 | 101.9 | 93.6 | 21.1 |
| | REIMB | 2.2 | 2.2 | -- | 2.2 | 1.7 | 77.3 | .5 |
| TSARCOM (TROSCOM) | DA | 190.7 | 154.1 | -- | 154.1 | 132.4 | 85.9 | 58.3 |
| | REIMB | 25.7 | 25.1 | -- | 25.1 | 17.6 | 70.1 | 8.1 |
| TECOM HDL, DA, etc. | | 81.8 | 70.3 | -- | 70.3 | 49.9 | 71.0 | 31.9 |
| TOTAL | DA | 5162.4 | 4256.4 | 106.7 | 4149.7 | 4176.7 | 100.7 | 985.7 |
| | REIMB | 1827.1 | 1459.4 | 4.7 | 1454.7 | 1538.3 | 105.7 | 288.8 |
| GRAND TOTAL | | 6989.5 | 5715.8 | 111.4 | 5604.4 | 5715.0 | 102.0 | 1274.5 |

Chart 18
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Progress in Applying C/SCSC

(U) The number of accepted implementations of the DOD Cost/Schedule Control Systems Criteria (C/SCSC), involving DARCOM-led reviews, increased from 74 at the start of FY 1977 to 90 at the end of FY 1977. There were 31 more applications of C/SCSC in various stages of the implementation process at the end of this fiscal year.

(U) Of the 90 accepted implementations, nine related to in-house development activities and seven to government-owned contractor-operated (GOCO) Army Ammunition Plants. Of the 16 accepted during the period, one was an Army Ammunition Plant and the remainder were contractor facilities. DARCOM continued to support the three C/SCSC training courses conducted by the Army Management Engineering Training Activity (AMETA), Air Force Institute of Technology (AFIT), and the Defense Systems Management College (DSMC). This support involved soliciting and screening applicants, review and advice concerning course content, and presentations and panel participation during classes. We also provided presentations to the Project Manager Development Course at the Army Logistics Management Center (ALMC) and to the Project Manager Orientation Course first at ALMC and then at DSMC. Also, this office provided representatives to participate in industry/government meetings and seminars on the subject of C/SCSC.

(U) Thirteen recommendations by a group of industry representatives concerning the improvement of C/SCSC and related matters were the subject of tri-service industry dialogue and resulted in improvement in various areas of concern to industry.

Independent Assessment of Project-Managed Programs

(U) A monthly independent analysis of cost/schedule performance and projections on the major contracts of the Army's "Big Five" Programs was performed and briefed DCGMD on the results. This office also analyzed other major acquisition contracts which received a Cost Performance Report from the contractor.

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Chapter VI

MATERIEL MANAGEMENT

Organization and Mission

Organization

(U) During this period of significant accomplishments, the Directorate for Materiel Management was commanded by Major General Fred C. Sheffey who departed on 22 September 1977 for a new assignment. He was replaced by Brigadier General Ernest A. Vuley.

(U) The lone internal organizational change was the establishment of the Program and Projects Office with an authorized strength of 16. Eight of these spaces were provided by DA to staff supervise the Signal Intelligence Electronic Warfare responsibilities transferred in February 1977 from the Army Intelligence and Security Command. The addition to these eight spaces brought the authorized strength for the Directorate from 148 to 156.

Mission

(U) The mission of the Director of Materiel Management was to establish policy and provide guidance and direction for the accomplishment of DARCOM supply, maintenance, and transportation responsibilities, including the preparation of DARCOM supply procedures governing centralized inventory management, inventory and asset control, requisition processing, distribution, storage, packaging and containerization, cataloging, traffic management, disposal and demilitarization operations.¹

(U) Three other areas where policy was established and guidance provided were in the determination of requirements for major items (to include ammunition), secondary items, and repair parts; in the preparation of the Army Materiel Plan; and in the DARCOM integrated materiel management operations.

(U) Also, the Director of Materiel Management served as DARCOM program and resource manager for assigned budget programs, and as the Army Executive Agent for the Direct Support System (DSS). He exercised operating control over the following: DARCOM depots, national maintenance points, national inventory control points (NICP), Major Item Data Agency (MIDA), Equipment Authorization Review Activity (EARA), Packaging, Storage and Containerization Center (PSCC), and Catalog Data Agency (CDA).

¹DARCOM-R 10-2, Organization and Functions, April 1976, p. 22-2.

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Director's Statement

(U) Some of the challenges met by this Directorate during FY 1977 are highlighted below:

After a number of delays, the realignment of Lexington-Blue Grass Army Depot onto a depot activity under the command and control of the Commander, Red River Army Depot, became a reality. This action was the last depot realignment under DARCOM Project CONCISE.

DARCOM supply performance suffered a set back during FY 1977 when stock availability fell to 79 percent and back orders rose to 192,000. Other indicators, such as on-time requisition processing and distribution effectiveness, showed a more encouraging trend.

The FY 1979-83 budget cycle was the first to be affected by OSD/OMB guidance on Zero Based Budgeting.

Intensive management of P7M Depot Maintenance Program was required in order to provide support to the higher priority items and commodity groups from available resources.

Resource allocations for Supply Depot Operations (PE 721111) continued to be extremely limited and much important work had to be left undone.

The FY 1977 command operating budget estimate (COBE) for Supply Management Operations (PE 721112) reflected a requirement of \$142.3 million of which \$18 million was unfinanced; however, this \$18 million plus \$3.2 million recognized during execution of the program was financed later through the DA mark-up and internal DARCOM adjustments.

A one-time box count of toxic chemical munitions was completed in June 1977.

DARCOM met its commitments for equipment in support of the Enewetak Cleanup Project.

Phase II of the Nonconsumable Item Program will result in a single wholesale manager for each depot reparable component and a single wholesale stock for all DOD users. OSD approved the implementation plan with a systems operational date of May 1978.

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Care of Supplies in Storage (COSIS) was a multi-million dollar segment of the P7S program that was not adequately funded but this office was making some progress in convincing DOD/DA budgeteers of its value.

The 1977 Boy Scouts of America Ninth National Jamboree provided a great experience for 21,931 scouts, but its success was dependent on our work in coordinating its logistical support.

The Army Oil Analysis Program (AOAP) continued its growth during FY 1977. Program effectiveness was vividly illustrated through the accuracy of the AOAP laboratories' predictions of component discrepancies (226 hits and 29 misses) and the resultant cost avoidance of \$36.2 million.

Significant effort was devoted to the improvement of the initial provisioning process through the revision of policy, procedures, military standards, and supporting ADP systems. Completion of these improvement actions was targeted for FY 1978.

The Maintenance Interservice Support Management Office continued to act as a strong advocate to achieve increased interservicing of depot level maintenance support among the Services. As of September 1977, a total of all interservice decisions reflected approximately \$45.9 million potential for annual interservicing.

Under Project MODLOG (Modernization of Logistics), DARCOM completed the acceptance of several logistics functions which were transferred from USAREUR. DARCOM also participated in several MODLOG actions, one of which was a joint test with USAREUR and the Military Airlift Command of the Air Line of Communications (ALOC) for Repair Parts. As of 30 September 1977, order/ship time for these repair parts had been reduced from the 1976 average of 61 days to 33 days.

As a result of various studies conducted in connection with realignment of the Army's intelligence operations, HQ DARCOM assumed wholesale logistics support functions previously accomplished by the US Army Intelligence and Security Command (INSCOM).

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Programs and Trends Evaluation

MILSTEP Improvement Program

(U) Deputy Assistant Secretary of Defense (DASD) Memorandum of 28 May 1975² requested an overall review and improvement of the MILSTEP reporting system. The plan of action was developed and sent to DASD (SM&S) on 18 July 1975 and approved on 21 August 1975.

(U) Objectives established to conduct the MILSTEP Improvement Program (MIP) included plans to incorporate materiel obligation validation reporting requirements to include dollar values in MILSTEP; stratify Materiel Obligations categorically by past due, current, and future issues including dollar value of each. Other objectives were to develop a standard input format for Military Standard Requisitioning and Issues Procedures (MILSTRIP) data that will provide uniform edit procedures DOD-wide for producing MILSTEP reports, and consolidate current reporting requirements. Further, it was important to examine the definitions of the Uniform Materiel Movement and Issue Priority System (UMMIPS) time segments in relation to actual practices, to ensure time standards were correct and current, and to validate requirements for exceptions to prescribed procedures and determine the need for identifying additional steps within each UMMIPS time segment. It was necessary to expand MILSTEP reporting for overseas shipments and deliveries, and include receipt take-up by requisitioner. Three other goals were to: develop the capability to sort all MILSTEP data into reports containing the same items presented in various budget submissions; develop the capability to produce MILSTEP reports for items managed on a weapon system basis; and develop a schedule for incremental implementation of approved improvements to the MILSTEP reporting system.

(U) To review MILSTEP Improvement Program (MIP) objectives and milestones in the plan of action, the DOD MIP Study Group convened 12 through 16 April 1976. The time frame for the MIP study was reduced from approximately seven months to two months and milestones were adjusted accordingly. This reduction of five months was possible due to (1) the DASD decision to conduct a complete study of the Uniform Materiel Movement and Issue Priority System (UMMIPS), for which the task was assigned to the Logistics Management Institute, and (2) the fact that many of the areas identified for review/improvement were dependent on other systems and procedures currently being developed and, therefore, were not conducive to the near term in-depth review by the study group.

²Deputy Assistant Secretary of Defense (DASD) Memorandum, 28 May 75, Subj: Military Supply and Transportation Evaluation Procedures (MILSTEP) Improvement Program.

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(U) The study group reconvened on 3-21 May 1976 and again on 7-25 June 1976, and proceeded with the overall review and improvement to the MILSTEP. Other topic areas were reviewed if considered an integral part of the MIP. The MIP Study results and recommendations were staffed with the Military Services, DLA, and MTMC from 4 August through 8 October 1976, after which the study group reconvened on 2 November 1976 to review the resulting comments and to resolve differences.

(U) Study parameters of the group were broad and encompassed a review of UMMIPS time segments; phases of the Military Standard Transportation and Movement Procedures (MILSTAMP) involving the Intransit Data Cards and expansion of overseas reporting for shipments and deliveries; the Military Standard Requisitioning and Issue Procedures (MILSTRIP), related to requisition submission, passing actions, receipt take-up documentation, and materiel obligation validation reports; and MILSTEP reporting requirements. The topics addressed in the study report were identified IAW objectives set forth in the MILSTEP Improvement Program (MIP) Plan, July 1975. In the time allowed, the study group attempted to analyze the topics in depth to ensure that conclusions and recommendations were beneficial to the system. To conserve resources required for MILSTEP reporting, maximum use was made of existing/proposed documentation and systems. Where new/existing resources of information were identified, recommendations were made to eliminate/reduce existing MILSTEP documents/reports. Recommendations were made to eliminate overlapping/duplicate reporting by internal Military Service/DLA systems and to require complete and uniform reporting by the Military Services/DLA.

(U) Approval of the MIP was announced by DASD (SM&S) memorandum dated 23 February 1977.³

Key Indicator Performance Trends

(U) Stock Availability and Backorders. Stock availability was measured as the percent of requisitions received for stocked items for which the entire quantity was available on the first computer edit against the National Inventory Control Point's asset record. The performance standard was 85 percent, measured monthly from the MILSTEP Supply Availability and Workload Report (DD I&L M-782). This standard was still retained by DARCOM as a key supply management performance indicator, although the "Logistics Performance Measurement and Evaluation System (LPMES)," from which the standard originated, was rescinded by Headquarters Department of the Army in January 1977 upon suspension of AR 11-20.

³DASD (SM&S) Memorandum, dated 23 Feb 77, Subj: MILSTEP Improvement Program Study Results and Recommendations

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(U) From the beginning of FY 1975 through the end of the FY 1977 period, 30 September 1976, DARCOM stock availability rose from 73 percent to 84 percent, measured on a cumulative basis, quarterly. The 84 percent rate of total fill remained constant through the 1st Quarter FY 1977; however, a 5-point decline occurred during the last three quarters of the fiscal year. Stock availability as of 30 September 1977 was 79 percent.

(U) The primary reason for the decline was a sharp upsurge in requisitions submitted to DARCOM major subordinate commands by the three Infantry Divisions and one Tank Brigade which were added to the Army force structure. After activation, these new units were filling Authorized Stockage Lists and Prescribed Load Lists (ASL and PLL) which created the increase in requisitioning activity. Marginal stocks were depleted and overall demand patterns changed, creating the decline in stock availability. As unit readiness improves, the demand base for follow-on replenishment support will adjust to the revised force structure and the overall rate of fill will recover.

(U) LPMES was also the prime source for the establishment of annual backorder reduction targets; however, a specific formula for developing the required targets was not developed and this task was left to the discretion of the individual services. The DARCOM back-order goal for FY 1977 was set at a level not to exceed 108 thousand. In the light of demand increases for the augmented Army force structure and continuing problems during the year with delayed procurement actions and contractor deliveries, this target proved to be seriously under-stated. Targets were subsequently revised during the 3d and 4th Quarters for the DARCOM MSC's, reflecting a year-end total of 181,000 backorders. As of 30 September 1977, backorders totalled 192 thousand, 6 percent above the adjusted goal. Generally, the backorder increase during the year was proportional to the drop in stock availability. In overall terms, DARCOM performance in preceding years has been much worse, with backorders 40 percent higher than at the end of FY 1977, against an annual requisition volume 15 percent smaller.

(U) On-Time Requisition Processing. DARCOM overall on-time requisition processing was measured on combined NICP and depot processing of all priority group requisitions which were not backordered (immediate issues). The target for FY 1977 was 90 percent.

(U) During FY 1977, DARCOM on-time performance increased from 77 percent to 87 percent, up 10 points. The substantial increase was due primarily to improved depot processing, particularly at the three distribution depots which now process about 92 percent of DARCOM lines shipped. Depot fund shortages which severely depressed FY 1976

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performance were not as pronounced in FY 1977. The shortfall of 3 percent from the 90 percent target, however, was due to depot fund shortages which minimized overtime usage.

(U) Performance by individual Readiness Command also improved in FY 1977 as follows:

| <u>MRC</u> | <u>Percentage End FY 1976</u> | <u>Percentage End FY 1977</u> | <u>Percentage Improve- ment/Regression</u> |
|-------------------------|-----------------------------------|-----------------------------------|--|
| ARRCOM | 72 | 86 | +14 |
| TSARCOM (Air) | 71 | 92 | +21 |
| ECOM | 82 | 87 | + 5 |
| MIRCOM | 79 | 92 | +13 |
| TARCOM | 78 | 85 | + 7 |
| TSARCOM (Troop Support) | 80 | 90 | +10 |

AVSCOM, MIRCOM and TROSCOM met or exceeded the target because of substantially better NICP processing which offset depot losses.

Distribution Effectiveness

(U) The DARCOM Distribution Effectiveness rate was the percentage of lines shipped to a given geographical area which were processed by the distribution depot supporting that area. It was the prime indicator of progress in implementing the revised DARCOM Secondary Items Distribution Plan. The objective was to ship 90 percent of all secondary item lines processed by DARCOM through the Distribution depots and thereby improve order and ship time to customers while reducing transportation and handling costs. The priorities for implementing the revised Distribution Plan were: Europe and Eastern CONUS; Pacific, Alaska, and Western CONUS; and Central CONUS and SOUTHCOM.

(U) During FY 1977, overall Distribution Effectiveness (all geographical areas) improved from 63 percent to 76 percent, up 13 points. The Eastern area (serviced by New Cumberland) increased by 4 points, from 72 percent to 76 percent; the Central Area (Red River) increased by 17 points, from 60 percent to 77 percent and the Western Area (Sharpe) increased by 25 points, from 49 percent to 74 percent.

(U) Performance by Readiness Command also improved substantially in FY 1977 with the breakout as follows:

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| <u>MRC</u> | <u>Percentage End FY 1976</u> | <u>Percentage End FY 1977</u> | <u>Percentage Improvement</u> |
|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| ARRCOM | 61 | 77 | +16 |
| TSARCOM (Air) | 68 | 79 | +11 |
| ECOM | 23 | 62 | +39 |
| MIRCOM | 62 | 80 | +18 |
| TARCOM | 61 | 76 | +15 |
| TSARCOM(Troop Support) | 72 | 85 | +13 |

(U) Improvement was due to variety of actions taken to improve stock distribution but the most significant common action was the bulk relocation of stock from non-distribution depots to distribution depots.

(U) The 14 percent shortfall from the 90 percent target was due primarily to the fact that MRC control over deliveries and issues, particularly on back order releases, was not adequate. Several changes in the CCSS system were developed to increase that control and were scheduled for implementation during this fiscal year. Continued progress was expected during FY 1978 but achievement of the 90 percent target was not expected before the 4th Quarter FY 1978, at the earliest.

Depot Performance

(U) DARCOM depot performance was measured on four key performance indicators: on-time storage processing; on-time transportation; on-time receiving (reporting and stowage); and materiel release denials. The table below depicts a performance comparison between end FY 1976 and end FY 1977:

| | <u>Percentage</u> | | |
|-------------------------------|-------------------|--------------|--|
| | <u>End</u> | <u>End</u> | |
| | <u>FY 76</u> | <u>FY 77</u> | <u>Percentage Improvement/Regression</u> |
| On-Time Storage Processing | 77 | 84 | + 7 |
| On-Time Transportation | 83 | 82 | - 1 |
| On-Time Receiving (Reporting) | 83 | 86 | + 3 |
| (Stowage) | 78 | 74 | - 4 |
| Materiel Release Denials | 1.4 | 1.7 | + .3 |

(U) The drop in on-time stowage of receipts and the slight increase in Materiel Release Denials resulted from a combination of 7S fund constraints and increased workload caused by the bulk inter-depot transfers described above.

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Materiel Management/Command Logistic Review Team Visits

(U) On 10 May 1976, the Supply and the Maintenance Directorates were merged into the Materiel Management Directorate and responsibility for conducting the annual National Inventory Control Point/National Maintenance Point reviews was assigned to the Associate Director for Evaluation. These visits were redesignated Materiel Management Reviews.

(U) Shortly thereafter, HQDA (DALO-RDR) issued a revision of AR 11-14, Logistic Readiness, which became effective on 15 August 1976. This regulation required that each Major Army Command (MACOM) establish a Command Logistic Review Team (CLRT) to visit subordinate elements for the purpose of identifying and initiating corrective action on problems that degrade the effectiveness of the wholesale supply and maintenance systems. If the team was augmented by HQDA, it was referred to as "Command Logistic Review Team - Expanded (CLRTX)." The purpose of the augmentation was to provide a means for HQDA (DCSLOG) to combine efforts with the MACOM to solve problems identified through a bottom-to-bottom analysis of the logistic system.

(U) Since the Materiel Management reviews already encompassed most of the objectives outlined by AR 11-14, the Directors of Materiel Management and Readiness agreed that responsibility for CLRT-CLRTX should be in the Directorate for Materiel Management, and accomplished by an annual Materiel Management/Command Logistic Review Team (MM/CLRT) visit to each Materiel Readiness Command (MRC). The procedures for the MM/CLRT included an advance survey of the potential participants and MRC to uncover problems that should be addressed during the visit and nominations of team members capable of addressing them. The composition of the team was ultimately based on problems selected for review.

(U) Throughout the preparations and the visit, the team chief stressed to the MRC that the mission of the team was to assist--not to inspect. Each observation prepared by a team member was coordinated with all involved MRC functional personnel through the directorate level to insure agreement on the facts presented. The recommendations identify responsibility at the MRC and also at HQ DARCOM, HQDA, DLA, other MACOM, or wherever a corrective action was necessary. A copy of the observation was provided to each action activity with a request to report on actions taken and copies of reports of action taken by outside activities were provided to the MRC. HQDA was provided reports of actions taken by HQ DARCOM elements.

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(U) During FY 1977, MM/CLRTX visits were made to HQ ECOM on 6-10 December 1976; HQ MIRCOM on 23-27 February 1977; HQ TARCOM on 1-5 August 1977; and HQ ARRCOM on 12-16 September 1977. The visit to AVSCOM/TROSCOM was delayed until 31 October 1977 because of the merger of those commands into TSARCOM.

Phase-Down of Lexington Blue-Grass Army Depot (Project CONCISE)

(U) On 22 November 1974, the Secretary of Defense announced that Lexington Army Depot (LBAD) would be realigned and reduced to a depot activity by 1 July 1976. There were several objectives to the realignments. One was to phase out the Communications Electronics (C-E) Maintenance mission workload at LBAD. Another was the organizational, staffing and operational realignment in supply mission areas resulting from the discontinuance of the maintenance mission, the DARCOM Revised Distribution Plan and the assumption of command and control by Red River Army Depot. The third objective was the organization, staffing and operational realignments in base operations activities resulting from the assumption of command and control missions by Red River Army Depot.

(U) In July 1975, legal actions were initiated by Congressmen from Kentucky that resulted in a preliminary injunction prohibiting any actions, to include planning sessions or meetings, with a purpose of implementing the realignment of LBAD. The preliminary injunction was dissolved on 10 September 1976. Consequently, on 17 September 1976, DARCOM requested DA to approve continuation of the LBAD realignment actions. On 21 September 1976, DA denied this request and advised that the LBAD case was being reviewed by higher authority. Eventually, in November 1976, DA granted authority for DARCOM to continue with the LBAD realignment actions.

(U) In March 1976, the phase out of the LBAD C-E maintenance mission was completed, and on 24 July 1976, LBAD was converted to the Lexington Blue-Grass Depot Activity under the command and control of the Commander, Red River Army Depot, thus completing Project CONCISE actions at LBAD.

Management Conferences

(U) The reorganization of DARCOM HQ in 1976 resulted in the amalgamation of both supply and maintenance responsibilities within the Materiel Management Directorate. This required a study of possible alternatives for conducting future conferences. The study concluded that two annual conferences, one supply, and one maintenance would be held.

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(U) A supply conference was held 29-31 March 1977 and was hosted by Corpus Christi Army Depot. Participants included the Director of Materiel Management and his Associate Directors; Directors of Materiel Management from the Materiel Readiness Commands; Depot Directors of Supply; Supply personnel from DESCOM; and representatives from other DARCOM supply support agencies and activities. The conference covered many problems/areas of interest, some of which were: supply performance trends, supply training, budget preparation/justification, bulk cushioning research, air line of communication, bar coding, NICP management improvements, depot 7S/7M posture, NORS/ANORS study and resultant procedures, LIF/MILSTEP differences, CCSS systems problems, and DOD Materiel Distribution Study.

(U) This conference successfully provided for an open exchange of the most pressing issues, developed solutions to a number of supply problems and permitted face-to-face contacts of supply counterpart personnel from throughout DARCOM thus enhancing future working relationships of these individuals.

Maintenance

Army and Joint Oil Analysis Programs

(U) Background. In 1961, after experiencing several internal problems in H23 helicopter engines and transmissions that resulted in the grounding of 350 of these aircraft, the Army entered the H23's in the Navy Oil Analysis Program. Due to the test reports received from the Navy, several components were disassembled and internal defects verified. As a result of these findings, the Army established its first laboratory at Fort Rucker in September 1961; a second laboratory was opened at the US Army Aeronautical Depot Maintenance Center (ARADMAC). Since that time, five additional Army laboratories have been established to support an expanding Army Oil Analysis Program (AOAP). During the Vietnam era, the aircraft workload was initially processed at ARADMAC and Fort Rucker. Later, contractor-operated laboratories were established to provide on-site support to Vietnam-based aviation activities.

(U) From 1961 through 1966, participation by aviation units in the AOAP was voluntary. In 1966, the Department of the Army directed that the Army Materiel Command prepare a plan to make the program mandatory - the result was the first Army regulation⁴ on oil analysis. The regulation⁵ currently covering AOAP activities was issued during 3d Quarter, FY 1977.

⁴AR 750-13, Spectrometric Oil Analysis, 5 December 1966.

⁵AR 750-22, Army Oil Analysis Program, 12 April 1977.

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(U) Nonaeronautical equipment was entered in the AOAP on a test basis in 1967 at which time samples from various items of equipment, such as M-578's and M-109's, located in Alaska were brought into the program. During 1968, additional test programs on nonaeronautical equipment were begun in Korea, Germany, and in CONUS (Fort Hood) with the resultant findings of all the tests supporting oil analysis as a useful supplement to existing maintenance procedures. Further evidence supporting the applicability of oil analysis to nonaeronautical equipment was obtained during an M60A2 test conducted at Fort Knox in 1971. This test included the AOAP as part of a comprehensive program that required the engines of five tanks to be operated to failure. Both engines and transmissions were included in the Oil Analysis test, and although no transmissions failed during the test, the five engines did. All five engine failures were predicted in advance by the laboratories analyzing the samples. Despite these successes, non-aeronautical equipment was not entered in the AOAP on a routine basis until February 1975, at which time the Deputy Chief of Staff for Logistics approved entry of all AVDS 1790 series engines. In May 1976, combat and construction vehicles equipped with 6V53 and 8V71 engines were also approved for entry in the AOAP. Approval for inclusion of these engines was due in part to the Breakdown Maintenance Test conducted by the US Army Forces Command (FORSCOM). The AOAP participated in this test, and FORSCOM credited the AOAP with saving 89 engines and reducing engine replacement by 25 percent. Other types of equipment in the AOAP are locomotives, watercraft, generators, and wheeled vehicles.

(U) In April 1975, the GAO evaluated the Services' Oil Analysis Programs and stated that the objectives set forth in 1972 were not being met.⁶ To achieve the previously established goals and to insure that the three oil analysis programs act in concert, the GAO recommended a single manager at DOD to manage the Services' programs. The DOD response to the GAO draft report did not concur in the single manager concept. As an alternative to the GAO recommendation, the Air Force Logistics Command, in coordination with the Army and Navy, introduced the Services' Oil Analysis Programs as a discussion item at the 18 July 1975 Joint Logistics Commanders' (JLC) meeting. At the 23 September 1975 JLC meeting, the JLC approved a revised joint agreement⁷ which was later signed by the Assistant Secretaries, Installations and Logistics. The agreement established the Joint Oil Analysis Program Coordinating Group and approved a Joint Oil Analysis Program Technical Support Center (JOAP-TSC). The basic purposes of the JOAP-CG and JOAP-TSC are spelled out in their respective charters.^{8 & 9}

⁶Joint Agreement for the Interservice Equipment Oil Analysis Program, 2 Oct 72.

⁷Tri-Service Agreement for the Joint Oil Analysis Program, 5 Jan 76.

⁸Charter for Joint AMC/NMC/AFLC/AFSC Commanders Joint Oil Analysis Program Coordinating Group (JOAP-CG), 23 Sep 75.

⁹Charter for Joint Oil Analysis Program Technical Support Center, 9 Jan 76.

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(U) In March 1975, a tri-service data system standardization committee was established to determine the feasibility of a central oil analysis data system, common forms, common codes, and standardized output reports. The central system was determined to be feasible and was established at Kelly AFB, Texas. Standardized oil analysis forms were designed, common data codes were established, and common output reports were agreed to.

(U) The US Army Aviation Systems Command was responsible for management of the program from its inception in 1961 until 1968. In 1968, the Army Materiel Command transferred this responsibility to the Army Maintenance Support Center, Letterkenny Army Depot. In 1973, responsibility for management of the AOAP was assigned to the US Army Maintenance Center (USAMMC), Lexington, Kentucky. Policy, guidance, and program direction were provided by the Department of the Army, Deputy Chief of Staff for Logistics, and Headquarters, US Army Materiel Development and Readiness Command, Directorate for Materiel Management. The current staff for the AOAP management office, Maintenance Support Branch, Maintenance Division, USAMMC, consists of four personnel.

Actions in FY 1977

(U) During FY 1977, the AOAP continued its growth. Approximately 420,000 samples were analyzed from aircraft and nonaeronautical equipment during this period which represented a 25 percent increase in workload over that of the previous year. Approximately one-third of the samples analyzed during this period were from nonaeronautical equipment.

(U) Program effectiveness for FY 1977 was vividly illustrated through the accuracy of the AOAP laboratories' predictions of component discrepancies. For example, the laboratories registered 226 "hits" (correct laboratory prognosis) and 29 misses (incorrect laboratory prognosis) for the year.

(U) This represents a laboratory equipment evaluation effectiveness of 89 percent, with a resultant cost avoidance of \$36,264,915. Due to a steadily increasing workload, DA DCSLOG approved a FORSCOM staff study recommending the establishment of additional laboratories.

(U) Funds for six spectrometers and 18 sets of physical property test equipment were obtained or provided for laboratory expansion. The spectrometers will be placed in the new laboratories while the physical property test equipment will be placed in all Army laboratories and other service laboratories analyzing oil samples from Army nonaeronautical equipment.

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(U) In an effort to extend AOAP benefits to other items of equipment, several test programs were begun. One of these tests looked at the feasibility of utilizing oil analysis to detect incipient failures in artillery recoil mechanisms and another looked at extending the hydraulic system oil change interval on M-578's. The former test was cancelled due to a lack of realizable benefits; however, the latter test was continuing. In addition, the new Fire Resistant Hydraulic (FRH) fluid was being tested to determine if its change interval could be extended. Successful conclusion to tests such as this could lead to extended lubricant life, thus resulting in energy savings. New developmental equipment considered for inclusion in the Army inventory - i.e., the XM-1 tank, was also entered in the AOAP.

(U) In the Joint Oil Analysis Program Arena, several actions transpired which had significant impact on both the JOAP-CG and the operation of the JOAP-TSC. The most noteworthy of these involved the repeated attempts by the Army and Air Force to have the JOAP-TSC relocated administratively from a division of the Naval Air Rework Facility to a tenant of the Naval Air Station. Its location as a division of the Naval Air Rework Facility was the result of a one-sided action by the Navy in June 1976. In September 1976, the Army pointed out that original plans called for the (JOAP-TSC's) location as an autonomous activity aboard the Naval Air Station, and that every effort should be taken to accomplish this. The Air Force concurred, but the action had not been accomplished at the close of this fiscal year.

(U) The growth in the number of tri-service laboratories and the resulting requirement for one service laboratory to analyze samples from another Service's equipment created a need for a common laboratory manual. The JOAP-TSC prepared drafts which were provided the JOAP-CG for review and comments. These were provided by all three services to the JOAP-TSC for final editing prior to publication in November 1977.

(U) The Joint Oil Analysis Program Research and Development Sub-Group, which was chartered by the JOAP-CG on 10 November 1976, to prevent further duplication of oil analysis program related tasks, began its work during the year. Their work centered on the specific objective of identifying all related oil analysis program tasks and preparing a catalog of RDT&E activities, projects, and reports for use within the Services' respective oil and analysis programs.

(U) The chairmanship of the JOAP-CG passed to the Army in August 1977. On 13 September 1977, Colonel Gerald Kirklighter, chairman of the JOAP-CG briefed the Joint Logistics Commanders on the background and status of the Joint Oil Analysis Program. During the briefing, Colonel Kirklighter pointed out that the JOAP-CG had been

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attempting, for approximately a year, to effect a host-tenant agreement between the Pensacola Naval Air Station and the Joint Oil Analysis Program Technical Support Center. The Commanders expressed their desire to finalize the host-tenant agreement as rapidly as possible. As previously mentioned, this had not been accomplished at the close of the fiscal year.

(U) In July 1977, a revision to the JOAP-TSC charter was also begun in order to more clearly define the duties and responsibilities of the JOAP-TSC. Work was continuing on the charter at the close of the fiscal year.

(U) The JOAP data system became operational during July 1977. Additional output reports were designed, which should satisfy the Army's oil analysis data requirements. Two Army laboratories began providing input data to the central system at the close of the fiscal year.

Essentiality Codes

(U) Historically, essentiality codes are data elements which designate the importance of every repair part to the operation of an end item. They are identified as essential to prevent deadline, essential for safety, legal or climatic reasons, deferrable or other.

(U) DA desired that essentiality codes serve an additional purpose; that is, to designate the maintenance level at which the parts were used. By this means, field units were able to identify in the Army Master Data File (AMDF) all those parts which were essential at their level of maintenance, and could thus develop lists of repair parts needed for wartime operations. This action will support the DOD Retail Inventory Management and Stockage Policy (RIMSTOP) Program.

(U) Action was underway to develop an automated program to integrate the three existing systems of essentiality codes, which were the obsolete H, S and L codes loaded in all data files, the Mil-Std 1552 codes in use by all DOD components but not yet loaded in Army files and the new codes desired by DA for internal Army use. It was planned that conversion can begin in June 1978.

Integrated Technical Documentation and Training (ITDT)

(U) The ITDT Program was a coordinated TRADOC/DARCOM effort to simplify and correlate technical publications and instructional documentation for the purpose of improving the capability of maintenance personnel in the field. This program consisted of two segments; the first being a simplifying, illustrating and clarifying of those

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technical publications previously used for reference. The second segment was the development of instructional literature to be used both in formal residence training and in extension training. It was the overall intent that the technical publications would be used not only as reference data and for performance of maintenance tasks, but would also serve as base documents for the development of instructional publications. The program was guided by a General Officer Steering Group chaired by the Deputy Chief of Staff for Training, HQ USATRADOC.

(U) ITDT consisted of the integration of Technical Manuals (TM) and Extension Training Materials (ETM) to provide simplified, illustrated, step-by-step maintenance procedures essential for use by unskilled personnel. The ITDT concept included a comprehensive equipment analysis to determine required maintenance and training tasks and a verification, performed by personnel representative of the intended users to determine product accuracy and usability.

(U) The ITDT Program was in effect for about two and a half years. During this period, several projects were initiated. Each one had, as a product, a total ITDT package. Prominent among these projects were contract efforts to develop ITDT for turrets on M60 series tanks and the M551 AR/AAV; 2½ and 5 ton trucks; and XM-1 Main Battle Tank.

Materiel Maintenance Management Career (MMM) Program

(U) In November and December 1976 MMM Career Program Managers or their designated representatives from DARCOM headquarters, MRC's, depots, and other elements, participated in a DA level MMM screening panel. MMM careerist's qualifications for promotion to grades GS-13 and above, DA-wide, were identified. Executive development group determinations were part of the screening process.

(U) In June 1977, the DARCOM level screening panel met to evaluate and rate MMM careerists eligible for promotion to GS-12 positions. Panel members included career program managers or their designated representative from all elements of DARCOM. The records of 853 careerists were reviewed and rated for promotion potential in the MMM career field.

(U) Subsequent to the DA-wide and DARCOM-wide screening panels, ad hoc panels consisting of three to six members of the respective panels, periodically evaluated reclaims to ratings awarded by panels as well as late submissions.

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(U) Promotion potential was determined by careerist's skills, knowledge, abilities, and personal characteristics (SKAP) to determine occupational and materiel codes in which they were considered highly qualified or qualified for promotion consideration.

(U) In July, a DA-sponsored conference of MMM career program managers from the DA MACOM's reviewed and recommended changes to CPR 950-17, Army Civilian Career Program for Materiel Maintenance Management, and the MMM SKAP.

Revision of Provisioning Policy, Procedures and Systems

(U) Significant effort was being devoted to the improvement of the initial provisioning process through the revision of policy, procedures, Military Standards, and supporting ADP Systems in CCSS. Those systems and procedures under review and revision are discussed below.

(U) Military Standards 1552 and 1561. These Military Standards prescribed the standard process and detailed procedures for the acquisition of provisioning technical documentation by all Services. They were under review by all Services and industry and were scheduled for revision by mid-calendar year 1978.

(U) AR 700-18. This was the key Army Regulation on provisioning within the Army. Extensive revision was being made to strengthen the policies and procedures governing provisioning evaluation, provisioning planning, the computation of provisioning requirements, cataloging, distribution of initial support, budget estimating, procurement and management of technical documentation, and interface between the field and the wholesale during the provisioning process. Completion was targeted for March 1978.

(U) DARCOM-R 700-46. This DARCOM Regulation described the DARCOM concept for management of initial provisioning within HQ DARCOM and the major subordinate commands. It also amplified the provisioning responsibilities of the specific staff elements of HQ DARCOM. Target date for completion was 15 December 1977.

(U) Essential Repair Parts Stockage Lists (ERPSL). This was a procedure that was under development by the DARCOM Inventory Research Office (IRO) that would provide justification for stocking non-demand supported mission essential repair parts in the field in support of highly important mission essential systems requiring high readiness availability. It was targeted for completion by the third quarter of CY 1978 with an interim procedure to be completed not later than mid-December 1977.

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(U) Revision of TM 38-715-1. This manual described provisioning techniques used by the Army. The revision of this manual will take more than a year to complete. MMC was tasked to do this job and was in the process of developing a work plan. Tentative estimate as to a completion date was June 1979 with individual chapters to be published for use as they are completed.

(U) Redesign of CCSS Provisioning System. For over a year ALMSA had been working on a major redesign of the CCSS Provisioning System. The redesigned system was scheduled for fielding in May 1978. This revised system will provide DARCOM with the capability of accepting provisioning technical data in standard DOD format. It will significantly facilitate joint Service provisioning projects.

Supply and Distribution

Automated Production Planning and Control System

(U) DARCOM-R 740-18¹⁰ was the vehicle that permitted DESCOM and the depots to exchange information on a variety of valid management interests such as program development, resource requirements, and performance evaluation. However, very little had been done to provide the depot supply manager with a tool that integrated workload projections, known workload and available resources as a basis for planning, scheduling and controlling work and resources at the level where the work actually is being done--the work center.

(U) In July 1975, DLA announced that they had made their automated Work Planning and Control System (WOPACS) operational at all their depots. The DLA system was widely briefed throughout DOD. All who heard it, including several of our depot commanders, received it favorably. The Commander of the New Cumberland Army Depot requested the development of a comparable system that could meet DARCOM application.

(U) The Logistics Systems Support Agency (LSSA) was tasked by DRCMM-S to develop a "me too" system but work was suspended shortly after it began due to DOD restrictions on new system development costing more than \$50,000. However, LSSA was directed to continue its efforts but to provide a basic, simple, unsophisticated product that could satisfy essential needs and stay within the \$50,000 threshold. This LSSA did by conducting a work shop in September 1976 at which time they presented to DARCOM, representatives from all depots and DESCOM, a general system concept proposal. There was general agreement by all parties that the system concept would be beneficial

¹⁰DARCOM-R 740-18 - Production Planning and Control for Supply Depot Operations, Installation Support Activities, and Base Operations.

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to the depots. It was agreed that depots would be permitted flexibility in system application and to use it in work centers they deemed particularly appropriate. LSSA was given approval to proceed with a systems change request dated October 1976. Target implementation date was early summer of 1977.

(U) An informal follow-up on the status of the system indicated that DESCOM was expressing some doubt about the project. On 4 May 1977, a status briefing was given to DRCMM-ST with LSSA and DESCOM in attendance. The DESCOM position was that the depots were cool to the system although the New Cumberland Army Depot (NCAD), the Tooele Army Depot (TEAD) and the Tobyhanna Army Depot (TOAD) were solidly for it. (LSSA had staffed the system concept with the depots and solicited comment). DARCOM attempted to suggest alternatives that might permit resolution of a serious philosophical impasse. DESCOM appeared to feel that the system should apply to all depots or none at all. DARCOM held out for a more moderate approach.

(U) A compromise was reached which in effect permitted continuation of work on the system. The plan was to allow NCAD to implement the system and, pending its acceptance, apply it to other depots that have an interest.

Care of Supplies in Storage (COSIS)

(U) COSIS was a multi-million dollar segment of the P7S program that had not been adequately funded at DOD/DA levels. FY 1979 funding guidance from DOD indicated that about 10 percent of a \$50 million requirement will be recognized.

(U) Because our ability to accurately forecast, justify and defend the COSIS program had been lacking, the thrust of our effort was to remedy this condition. We briefed DA (functional and controller) representatives regarding the step by step logic that permitted us to develop the total COSIS requirement. Not only could we convey to the "budgeteers" what the program consisted of, but could document in economic terms the benefits of performing COSIS while materiel was in storage rather than at time of shipment.

(U) The results of our efforts to date have brought about a higher level of understanding of COSIS. This was evidenced in an increase of some \$5 million from DA for the FY 1978 program which now stood at \$7 million.

(U) Tasked with formally documenting the methodology went to the DARCOM Packaging, Storage, and Containerization Center. DESCOM, the

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Ammo Center and the Quality Assurance Field Activity were involved in this effort. The completion date including documentation was scheduled for May 1978.

DLA/GSA Redistribution Program - Project "CNS"

(U) There was an estimated \$12 million in DLA/GSA excess accumulated at CONUS posts, camps, and stations as a result of a DA imposed moratorium of DLA/GSA shipments to the Property Disposal Officer (PDO). Project CNS was the redistribution of these Army-owned DLA/GSA-managed excesses within CONUS. (Project CNS procedures had been designed to preclude uneconomic turn-in of needed Army materiel to PDO while providing relief to the HQDA imposed moratorium).

(U) A pilot program designed to redistribute the Army-owned assets to field units in need of them was conducted utilizing Forts Ord, Lewis, Carson, and Richardson as test installations. Once again, excess materiel was reported to DLA/GSA. Materiel directed to PDO was reported to General Materiels and Petroleum Activity (GMPA), and passed by a 12-month demand history. Those items having three or more demands in twelve months were directed to Sacramento Army Depot (SAAD). Upon receipt, SAAD notified GMPA which advised the Defense Automatic Addressing System (DAAS) to change routing on requisitions for those national stock numbers in the assets in SAAD to GMPA. Materiel with less than three demands was directed to PDO under CNS procedures. Upon reduction of each national stock number to zero balance at SAAD, GMPA advised DAAS to return routing to normal source of supply.

(U) The results of the test program indicated a potential recovery of 68 percent of the dollar value of materiel directed to PDO. DA had proposed a phased implementation of CONUS posts, camps, and stations to include DARCOM installations into the CNS program, commencing 1 September 1977, for a period of one year at which time the DA imposed moratorium would be lifted and normal excess reporting procedure reinstituted.

DOD Support to the Boy Scouts of America

(U) Public Law¹¹ authorizes the Secretary of Defense to support the Boy Scouts of America (BSA) at their National and World Jamborees. The 1977 Ninth National Jamboree was held at Moraine State Park, Pennsylvania on 3-9 August 1977. DARCOM was designated the DOD action agency responsible for coordinating all matters relating to the support of the Jamboree and within this delegated authority, the US Army Forces Command (FORSCOM) was tasked to provide on-site administrative and operational support.

¹¹Public Law 92-249, 92d Congress, March 10, 1972.

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(U) Support of the Ninth National Jamboree encompassed the loan of equipment, supplies, transportation, and certain services necessary to the extent available without jeopardizing the National Defense Programs.

(U) The FORSCOM Support Group from Fort George G. Meade assisted the BSA in preparation for the Jamboree and coordinated all on-site assistance with Jamboree officials. It provided such items as tents, cots, blankets, sheets, materials handling equipment, assorted military vehicles, and medical supplies. The Federal Supply Service, General Services Administration provided 4,000 steel folding chairs, and 200 back pack pumps. The 76th Engineer Battalion (Combat Heavy) at Fort Meade surveyed and staked out the campsites and the site for the Army medical treatment facilities, constructed 1,600 feet of floating bridge sections, and prepared landing pads to be used for medical evacuation helicopters. An Army medical treatment facility was erected at the site by the 85th Medical Battalion. This consisted of the Army's latest air inflatable Mobile Unit Surgical Transportable type, commonly called "MUST" hospital. The hospital was fully equipped with the latest medical field equipment which provided in-patient medical care for 100 patients, with an additional 100 bed expansion capability.

(U) All requirements were met except for locating 35 each passenger buses (30 - 40) and six each tractors with rotary mowers. These items were obtained from the local area.

(U) The 1977 Ninth National Jamboree provided a great Scouting experience for 21,931 Scouts in troops, including 202 international Scouts from 25 countries belonging to the World Scout Conference. Adding troop leaders, staff, and support personnel, there were 28,601 people living on the Jamboree site. The BSA stated that this Jamboree was one of the best they have ever had.

Cataloging

(U) Feasibility Study On The Centralization of Cataloging. The follow-on study effort conducted by the Logistics Studies Office (LSO) of ALMC was completed and forwarded to HQ DA for approval. The conclusions and recommendations supported the original study done by DARCOM, in that it is functionally feasible to perform Federal Cataloging functions at a central location. The study further recommended that another economic analysis should be conducted prior to rendering a decision due to the personnel reductions that transpired since the original study. Additionally, the follow-on study concluded that it was not feasible to include the DARCOM Catalog Data Activity with a central cataloging activity, and that it was not feasible to colocate

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at the Defense Logistics Services Center. DARCOM supported the LSO recommendations and further recommended to HQ DA to defer decision on this matter until the present reorganization efforts had subsided.

(U) SB 700-20/AMDF Integration. In November 1976, DA approved the General System Description for the integration of SB 700-20 and the Army Master Data File (AMDF). This included the transfer of responsibility for publishing SB 700-20 from the Depot System Command (DESCOM) to the DARCOM Catalog Data Activity (CDA). CDA and DESCOM had jointly identified the functions and personnel spaces to be transferred. Also, they had developed the systems and procedures to be employed in producing both the SB 700-20 and the AMDF from a single integrated data base. This will assure compatibility of the two at the time the SB 700-20 is published. All of the ADP systems and procedures had been developed and were being tested by CDA and DESCOM. The new system will be implemented 1 December 1977 with the first SB 700-20 published by the CDA to be effective 1 September 1978.

(U) USA DARCOM Catalog Data Activity (CDA) Remote Job Entry (RJE) Data Processing Terminal. The automatic data processing (ADP) workload of CDA was transferred on 1 June 1976 from New Cumberland Army Depot (NCAD) to the USA Depot System Command (DESCOM), Letterkenny Army Depot (LEAD). This required a daily courier run between NCAD and LEAD to transport ADP input and output products. On 1 June 1977 an RJE data processing terminal was installed at CDA to provide direct communication between CDA and the DESCOM computer, improving responsiveness and eliminating the daily courier run.

Inventory Accounting

(U) One Time Box Count of Toxic Chemical Munitions. DA directed a one-time box count of toxic chemical munitions and bulk agents in DARCOM storage. Although the task was directed in June 1976, the majority of the work took place during the period of January-June 1977. The count was completed on 30 June 1977. Many of the munitions had been in block storage, which precluded visual verification of each container. These were being rewarehoused to a two-stack configuration to facilitate inventory. Those items not being rewarehoused into two-stack configuration were removed from storage during the count to allow visual verification.

(U) Inventory and Accountability of Small Arms. New procedures for inventory, accountability and security of small arms were developed during 1976 and made specific recommendations to the DA. The new procedures were approved and actions were initiated to update DARCOM and Army regulations. These procedures for small arms were being incorporated as separate chapters to the regulations, thereby

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emphasizing the guidance. Each small arms adjustment (loss or gain) was explained in detail in the report of Inventory Control Effectiveness (ICE) provided to the DA. The explanations also tended to stress the need for special emphasis on inventory and accountability of small arms.

(U) In-Float Controls. DARCOM directed the Logistics Systems Support Agency to develop an improved in-float control system at depots for improving the accuracy of inventories. In-float documentation consisted of receipts, issues and adjustments which occurred on items being inventoried. They resulted from DARCOM's open inventory policy, which allowed business to continue as usual while items were being counted. Testing was scheduled for January 1978 with implementation in February 1978.

(U) The primary improvements included the procedure that when difference between any count and the record was less than \$500, the record was to be adjusted to the count on all non-sensitive items. Also, the documents under inventory control were to be annotated to indicate the item was being inventoried.

(U) In-floats were to be identified, and inventory and storage personnel instructed to close the transactions and update the computer before the count. Finally, the computer was to be updated daily on items under inventory.

DARCOM Support for the Enewetak Cleanup Project

(U) Comprised of 41 smaller islands, the Enewetak Atoll is located some 2700 miles southwest of Honolulu and 550 miles southwest of Wake Island.

(U) The United States Government was committed to return Enewetak Atoll to the people of Enewetak after an extensive cleanup and rehabilitation program had been completed. In July 1976, Congress appropriated 20 million dollars to finance the cleanup project.

(U) The appropriations act included that "all feasible economies should be realized in the accomplishment of this project through the use of the Military Services' Construction and Support Forces, their subsistence, equipment, materiel, supplies, and transportation, which have been funded to support ongoing operations of these forces. Further, such support should be furnished without reimbursement from military construction funds."

(U) In January 1977 the Military Services were tasked to provide full support for the Enewetak Atoll Cleanup Project. On 2 February

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1977, the Army was given the overall responsibility and in turn, DA nominated FORSCOM as the executive agent for the cleanup project. The actual work was being accomplished by personnel of the 84th Engineering Battalion, Honolulu.

(U) The plan called for the removal of non-radioactive vegetative undergrowth, debris, and structures which the population desired to have removed, and the removal of all radioactive debris and soil which posed radiation or other hazards to human habitation. The cleanup project was planned to last 34 months, ending in 1980.

(U) On 22 March, FORSCOM requested requisitioning authority from DA for some 187 lines totaling 907 major end items. The required delivery dates for these items were broken down into three phases, a May, August, and November 1977 time frame. On 25 March 1977, DA approved the requisitioning authority and further advised that equipment not available in DARCOM should be withdrawn from FORSCOM units.

(U) The Associate Directorate for Supply and Distribution was given the responsibility to staff supervise the materiel delivery actions. This function was to monitor the supply program to insure the expeditious accomplishment of all supply transactions necessary in meeting established required delivery dates at Enewetak. All DARCOM commitments for equipment were met.

(U) In addition to supporting the project with equipment needs, DARCOM also provided a six man team to deprocess the engineering and automotive type equipment as it arrived at the island.

Nonconsumable Item Program

(U) Under the direction of the Joint Logistics Commanders, the Interservice Nonconsumable Item Subgroup of the Joint Policy Coordinating Group on Defense Integrated Materiel Management, developed Joint Service policies and procedures to accomplish the intent of DOD Management Objective 8, Action 6. This was to eliminate Duplicate Wholesale Inventory Management as it applied to nonconsumable items. The procedures provided for the actions to be accomplished in two separate but related phases - I and II.

(U) Under Phase I, a Lead Service/Primary Inventory Control Activity (PICA) was selected for each National Stock Numbered non-consumable item (end item and depot reparable component). Ammunition, cryptological, and nuclear items were excluded from this program and were to be addressed separately by the cognizant agencies/activities. The PICA single manager assignment included the functional responsibility for cataloging, procurement, disposal, and depot level maintenance. The

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latter, which was optional, was to be performed under a Depot Maintenance Interservice Support Agreement (DMISA). Wholesale Interservice Supply Support Agreements (WISSA) currently established, will normally remain in effect. The supported Service(s)/Secondary Item Control Activity(s) (SICA) will continue to be responsible for determining its own requirements, budgeting and funding, maintaining accountability, storing and issuing, distributing and redistributing, and determining excesses. Phase I was operationally underway by the DARCOM Materiel Readiness Commands (MRC).

(U) Implementation of the Phase II plan will result in a single wholesale manager for each depot reparable component and a single wholesale stock for all DOD users. In general, this will include a single wholesale stock, sole development of budgeting of depot repair requirements, single budgeting and funding of requirements to support wholesale stock, materiel returns program, credit exchange, critical item management, and wartime surge requirements. The plan was approved by the Joint Logistics Commanders and the OASD(I&L) which directed that the necessary resources be provided to meet the systems operational date of May 1978. Maximal use will be made of existing DOD systems/procedures which must be modified to accommodate this interservice program. The Commodity Command Standard System (CCSS) must also be modified to enable the Army to perform within the DOD program parameters.

Requirements and Resources

Retail Stock Fund Operation

(U) Fiscal Year 1977 saw the stabilization of the changes made during FY 1976 and FY 197T in relation to the DARCOM Installations Division (AMCID) retail stock fund operations. The replacement of AMCID supply management with Army Industrial Fund Support was completed, and the AMCID branch at the Mainz was established and operating. After successfully weathering the cash flow and customer demand variables, the DARCOM Division (wholesale) Army Stock Fund operations stabilized. Program accomplishment reached a highly satisfactory level for FY 197T, particularly due to judicious exercise of the program transfer authorities delegated to this office by higher authorities.

(U) In the area of Procurement Appropriation, Army (PAA) financed spares and repair parts, DARCOM was placed under close scrutiny by the OSD/OMB analysis concerning the "Repair Cycle" element of the requisitioning objectives of our National Inventory Control Points. Although our FY 1977 programs and budgets were not impacted, the Program

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Budget Directive for FY 1978, in effect, directed that the Repair Cycle elements would be reduced in FY 1978, and further reduced in FY 1979. Since this was a very significant element, both from a dollar requirement and operating standpoint, this matter was under study to include all actions that occurred in the Repair Cycle time period from the time an item manager made the decision that rebuild/overhaul of a quantity of an item was required until the hardware was picked up in a ready-for-issue status. This was an on-going effort which will continue into FY 1978.

(U) Personnel of this office participated in a Logistic Evaluation Agency, DCSLOG, DA study relative to classification of secondary items/repair parts as to investment (PAA-financed) and expense (Army Stock Fund financed). The study recommendation to the DA staff was to the effect that the PAA secondary item accounts be abolished; items considered as PAA secondary would be realigned to Army Stock Fund with a minimal number being realigned to major item type management. If study recommendation is accepted, FY 1980 would be the earliest time realignment action could be taken.

(U) Program for improvement of secondary items/repair parts programs and budgets continued during FY 1977. (NOTE: Although occurring in FY 1978, OSD/OMB analysts have verbally stated to DA staff and DARCOM representatives that the FY 1978 Reapportionment Requests - FY 1979 Budget Estimates submitted by DARCOM are the best those analysts have seen, to include those submitted by other services.)

(U) During FY 1977, the assistant for secondary items program was given responsibility for programming and budgeting for P7M support for rebuild of PAA secondary items. Changes to the secondary item stratification process were made to accommodate this newly assigned responsibility. Personnel from this office participated in development and defense of FY 1978 and FY 1979 P7M requirements.

P7M Depot Materiel Maintenance and Support Activities

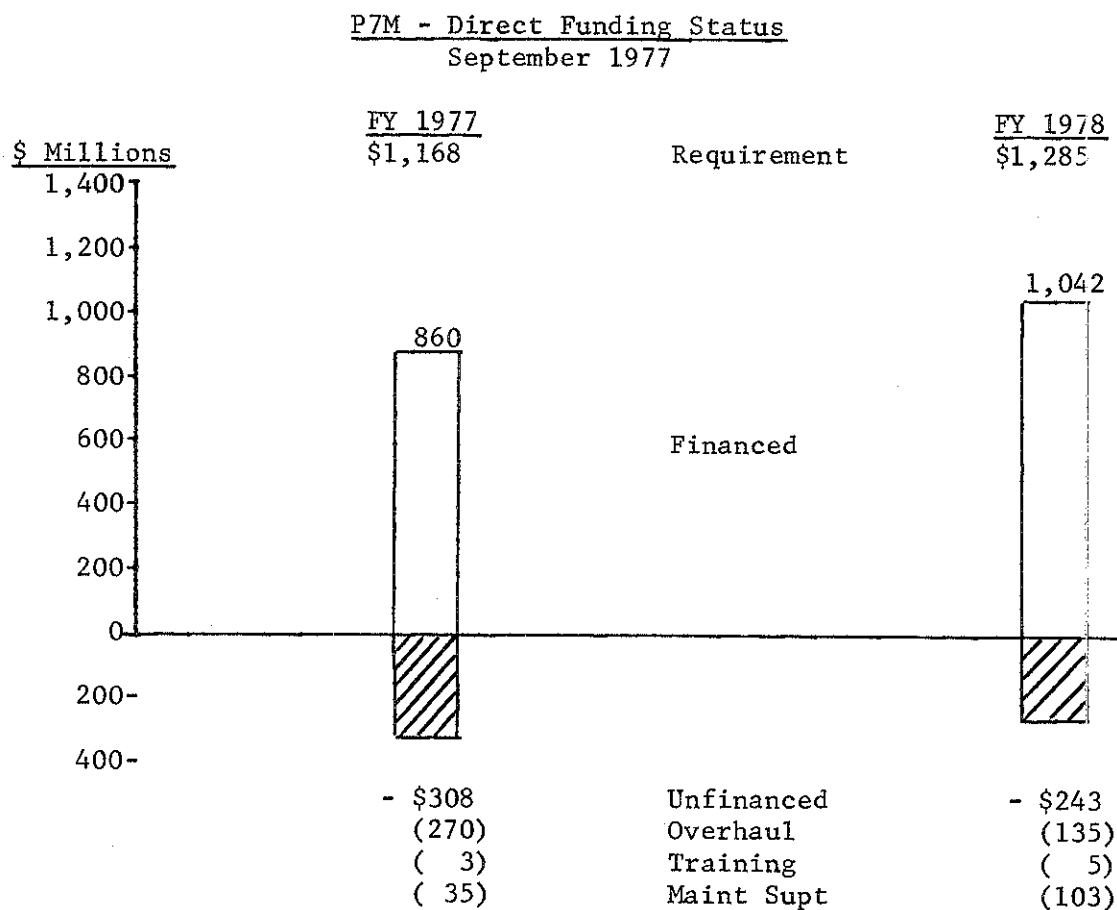
(U) Fiscal Year 1977 was characterized by a requirement for intensive management of the P7M program in order to provide resource support to the higher priority items and commodity groups. This left unfunded those items and commodity groups of lesser priority, even though the unfunded backlog items were essential in the long run to materiel readiness. The need to accommodate the highest priority programs within available resources, against the backdrop of rapidly increasing costs for labor, repair parts, and other materiel, generated innumerable reprogramming actions in an unending effort to support command priorities for overhaul of materiel.

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(U) Certain events highlighted the P7M program in FY 1977. During this period there was a continuing adjustment to policies, operating procedures, and re-examining areas of delegation of retention of authority to develop properly interfaced methods of operation between HQ DARCOM and DESCOM established on 1 September 1977. Meanwhile, there was the assumption of full responsibility by HQ DARCOM from USAREUR of operation of the Mainz Army Depot, and its inclusion within DARCOM into the Depot System Command. Also, the establishment of a concept of "fixed cost" in depot maintenance and overhaul prices, in an effort to reduce program change turbulence in the P7M program. A major staff effort took place in the Program and Resource Review (PARR) for FY 1979-1983 in order to provide a sound basis for development of the Command Operating Budget for FY 1979 submitted in August 1977. Finally, there was the inclusion of the techniques of the Zero-Based Budget (ZBB) in the development and submission of both programs and budgets for review and approval by higher headquarters.

(U) The magnitude of the P7M program for FY 1977 and FY 1978 can be seen in the chart below.



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Selective Program Elements (PE and OMA Budget)

(U) The Director of Materiel Management was responsible for Program Elements (PE) of the Operations and Maintenance, Army (OMA) Budget and has partial responsibility for another. These PE's were COMSEC, Supply Depot Operations, Transportation, and Attendant Supply Services.

Communications Security (COMSEC)

(U) The COMSEC Commodity Manager at Fort Huachuca, Arizona, provided for the operation of the COMSEC National Inventory Control Point, COMSEC National Maintenance Point, and the Army COMSEC central point of record. COMSEC Depot Operations at Lexington-Blue Grass Army Depot (LBAD), Kentucky, provided for the receipt, storage and issue of COMSEC materiel, maintenance, modification of COMSEC equipment/components and funds for design control repair parts. The following was a summary of the FY 1977 financing of this element:

| | (Dollars in 000) | | |
|-----------|--------------------|-----------------|-------------------|
| <u>FY</u> | <u>REQUIREMENT</u> | <u>FINANCED</u> | <u>UNFINANCED</u> |
| 1977 | \$8,260.0 | \$8,260.0 | - |

(U) Prior to FY 1976, a steering committee was established to deal with all matters involving logistic transfer of materiel management responsibilities for logistical support of electronic warfare (EW) and signal intelligence (crypto activities) (SIGINT) equipment. DARCOM will assume responsibility for PE 381011 (EW/SIGINT) beginning FY 1978. Reporting of COMSEC supply data in this headquarters was rather limited, such as workload, cost, and man-hours expended. As a result, this office developed reporting requirements for the supply depot operations at LBAD and the NICP operations at Fort Huachuca.

Supply Depot Operations

(U) This program element provided for internal supply operations of Army Depots and Arsenals. Also, it embraced receipt, storage, issue and shipment of assigned stocks and all operations incident thereto. Included were stock control activities when performed in depots and administrative portions of traffic management performed within depots.

(U) In summary, this element received the following financing:

| | (Dollars in Millions) | | |
|-----------|-----------------------|-----------------|-------------------|
| <u>FY</u> | <u>REQUIREMENT</u> | <u>FINANCED</u> | <u>UNFINANCED</u> |
| 1977 | \$312.6 | \$211.4 | \$101.2 |

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(U) The FY 1977 Command Operating Budget Estimate (COBE) for this PE was estimated at \$312.6 million of which \$211.4 million was financed and \$101.2 million remained unfinanced. The \$312.6 million and 11,898 man-years were required to support the forecasted receiving workload of 1,124,000 short tons and 2,975,000 line items; shipping workload of 1,047,000 short tons and 5,205,000 line items; and other supply depot operations workload. During the process of mid-year review and year-end adjustments final resources allocation to this program element resulted in \$252.0 million and 9,929 people on board as of 30 September 1977.

(U) Year-end unobligated funds available at HQ DARCOM and DESCOM in the amount of \$9.2 million were placed on project orders by DESCOM to reduce FY 1978 unfinanced items that were carried over from FY 1977. The remaining large unfinanced requirements at the end of FY 1977 included care of supplies in storage (COSIS), inventory of toxic chemicals, ammunition renovation/modification, and ammunition peculiar equipment (APE).

(U) Resource allocations to this PE continued to be extremely limited, far below requirements, because of the inability of higher echelon analysts and decision makers to understand or fully appreciate a complicated program that covered virtually the entire spectrum of logistics. The foregoing resulted in the non-accomplishment of much important work in supply depot operations.

Supply Management Operations

(U) Provided for the operation of CONUS National Inventory Control Points (NICP), Service Item Control Centers (SICC)/Secondary Inventory Control Activities (SICA), including inventory control, cataloging, stock control and direct support functions. The FY 1977 financing for this program element (PE) was \$145.5 million while the FY 1977 COBE reflected a requirement of \$142.3 million, of which \$18.0 was unfinanced. This unfinanced amount together with an additional \$3.2 million recognized during execution of the program were financed through the DA mark-up and internal DARCOM adjustments.

(U) This PE supported five NICP's and other supply management type activities. Workloads continued their upward trend as a result of new weapons systems entering the supply system, foreign military sales (FMS), MODLOG, and the direct support system (DSS). In addition, other mission assignments were supported; e.g., single manager for conventional ammunition (SMA), total Army equipment distribution program (TAEDP), increased control and management of the FMS program, and project ATHENA, (EW/SIGINT).

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Second Destination Transportation

(U) Provided for second destination transportation of Army cargo via land, air and sea, and received the following financing:

| <u>FY</u> | <u>(Dollars in Millions)</u> | | |
|-----------|------------------------------|-----------------|-------------------|
| | <u>REQUIREMENT</u> | <u>FINANCED</u> | <u>UNFINANCED</u> |
| 1977 | \$46.7 | \$46.4 | 3 |

(U) The breakout of the FY 1977 funded requirement of \$46.4 million was as follows: \$41.4 million was required to support Commercial Line Haul Freight for the movement of 602,855 short tons of materiel; \$0.6 was required for commercial air transportation for the movement of 1,064 short tons; \$0.2 million was required for thru bill of lading for the movement of 1,026 short tons; \$3.2 million was required in the contractual, rental and lease area of which \$1.7 million was for the Flyaway Program at TSARCOM and \$200,000 for the marine maintenance program at TROSCOM; and \$1.0 million was required for the support of the Joint Container Control Office at Tobyhanna Army Depot.

The Direct Support System (DSS)

(U) Follow-on technical assistance visits to CONUS installations continued throughout FY 1977. During this period, the test of DSS in USAR units of First Army was completed and approved for extension throughout First Army. In addition, tests with USAR units in Sixth Army began in September 1977. A complete revision of the DSS procedures manual FM 38-725 was made and the draft distributed for comments.

Programs and Projects

Modernization of Logistics (MODLOG)

(U) MODLOG was established to streamline the USAREUR logistics structure and operations, increase reliance on CONUS and increase host nation, and contractual support. DARCOM completed the acceptance of several logistics functions which were transferred from USAREUR as part of the October 1976 Memorandum of Understanding between DARCOM and USAREUR. DARCOM also continued to participate in other ongoing MODLOG actions.

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(U) Those actions transferred from USAREUR to DARCOM were:

(U) IL/FMS Cases. USAILCOM Washington Field Office informally accepted responsibility for USAREUR's International Logistics case workload. Details had not yet been formalized as part of the basic MODLOG Memorandum of Understanding (MOU).

(U) NORS Reporting. The DARCOM Logistic Control Activity, San Francisco, California, began producing monthly performance reports for USAREUR that will show wholesale supply support performance on USAREUR DSS NORS/ANORS requisitions. It was formalized on 18 February 1977 as Annex H to MODLOG MOU.

(U) TAMMS Reporting. The Maintenance Management Center, Lexington, Kentucky, committed itself to the preparation and distribution of numerous tactical vehicle maintenance management reports for USAREUR commands. It was formalized on 18 February 1977 as Annex D to MODLOG MOU.

(U) DOD Small Arms Serialization Program Reporting (DODSASP). The Army Registry for small arms serialization reporting at ARRCOM, Rock Island, Illinois, began communicating directly with USAREUR reporting activities on matters related to small arms transaction reporting, thus eliminating a reporting layer in USAREUR. A Command control point remained in USAREUR for the purpose of emphasizing the DODSASP and providing command direction in the event that problems arose between the Army Registry and USAREUR reporting units. It was formalized on 1 August 1977 as Annex I to MODLOG MOU.

(U) Those actions in which DARCOM participated were:

(U) Air Line of Communications (ALOC) for Repair Parts Test. Commencing 4 January 1977 through the remainder of FY 1977, DARCOM had participated with USAREUR and the Military Airlift Command in a joint test of an ALOC for repair parts to 89 selected maintenance type support units in Germany. New Cumberland Army Depot Consolidation and Containerization Point palletized on Air Force 463-L pallets approximately 1500 short tons of repair parts per month which were shipped to Dover AFB for daily delivery to Rhein Main or Ramstein Air Force Base. Upon arrival of the repair parts in Germany, daily deliveries were made by the 37th Transportation Group to the designated support unit. As of 30 September 1977, Order Ship Time for these repair parts had been reduced from 61.3 days (1976 average) to 32.8 days.

(U) Reduction of USAREUR Depot Stocks. On 10 January 1977, DARCOM implemented with USAREUR, all other services, Defense Logistics Agency, and the General Services Administration, a depot inventory

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reduction plan for the purpose of reducing USAREUR depot stocks down to war reserve, operational project and decrement stocks. As of 30 September 1977, DARCOM depots had received in excess of 11,000 short tons from USAREUR.

(U) Remote Area Support of Southern European Task Force Units. In conjunction with Department of Army and SETAF, DARCOM was improving the logistics support of SETAF units in Italy, Greece and Turkey by airlifting predominately all supplies to these units. This amounted to approximately 150 short tons per month.

(U) As of 30 September 1977, three major MODLOG actions were in their final stages:

(U) Direct Requisitioning. On 1 November 1977, V Corps will discontinue requisitioning through USAREUR MMC and commence requisitioning directly on CONUS Sources of Supply via Defense Automatic Addressing Switching Office. The VII Corps and 21st SUPCOM will follow suit on 1 February 1978.

(U) Depot Inventory Reduction. The estimated completion date for this action was 31 December 1977.

(U) Transfer of Accountability for War Reserve Stocks from USAREUR to DARCOM. With the completion of the Phase II study effort by Department of Army, a final decision on this proposal was expected during FY 1978.

Logistics Intelligence File (LIF)

(U) The Logistics Intelligence File (LIF) maintained by the Logistic Control Activity (LCA), Presidio of San Francisco, California, provided the Army with the unique ability to monitor supply and transportation performance in all segments of the distribution system. Data and management reports produced from the LIF were being increasingly relied upon for input in reaching critical decisions.

(U) A comprehensive quality control program has been implemented by the LCA which provides for continuous monitoring of the LIF. A Study Advisory Group (SAG) was established to review, periodically, study progress. The SAG is co-chaired by the Assistant Director Supply Management, DA DCSLOG, and the Deputy Director for Materiel Management, HQ DARCOM. Attendees include representatives from USAREUR, General Services Administration, and New Cumberland Army Depot.

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(U) In order to ensure that the LIF contained the most accurate data possible, the LCA initiated a priority project to conduct a complete examination of the LIF. The effort examined LIF input, program logic, and reports (output) generation. SAG meetings were scheduled on a quarterly basis with the first being held at HQ DARCOM on 6-7 April 1977. The second was held on 19-20 July 1977 at NCAD. Significant progress was made in the examination of the LIF and a number of program errors were detected and corrected which will improve the accuracy of the LIF.

(U) The "LIF Change Control Board" was established for the purpose of conducting reviews of LIF change requests and for determining the status of change in process of implementation. This board was co-chaired by the Chief, Supply Policy Division, Directorate for Supply and Maintenance, HQDA, and the Chief, Programs and Projects Office, Directorate for Materiel Management, HQ DARCOM. The Commander, Logistics Control Activity, was the executive secretary, while HQDA and DARCOM provided three members, in addition to the co-chairmen.

Transfer of Logistics Functions from INSCOM to DARCOM

(U) As a result of various studies conducted in connection with realignment of the Army's intelligence operations, HQ DARCOM assumed wholesale logistics support functions previously accomplished by the US Army Intelligence and Security Command (INSCOM) (formerly US Army Security Agency).

(U) As a part of the transfer of logistics functions, DARCOM assumed operational control of the USASA Materiel Support Command (MSC) on 1 December 1976 and command of the MSC on 7 February 1977. The MSC was redesignated the US Army Electronics Materiel Readiness Activity (EMRA) effective with assumption of command responsibilities. Staff supervision of EMRA was assigned to the Director of Materiel Management.

(U) In order to effect an orderly and efficient transfer of logistics functions, an Electronics Warfare/Signal Intelligence (EW/SIGINT) team was established in the Programs and Projects Office of the Directorate for Materiel Management. This team also served as the DARCOM focal point for matters pertaining to Communications Security (COMSEC).

(U) An additional study was conducted during FY 1977 for the purpose of considering alternatives to either continue operation of the EMRA at Vint Hill Farms Station, Warrenton, Virginia, or to relocate the activity to other existing DARCOM installations. The study entitled "Study of EW/SIGINT/COMSEC Materiel Management at Depots, EMRA, ECOM, CSLA and INSCOM" (short title - Project DECI) was

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conducted by the Directorate for Plans and Analysis. The study group's recommendation was forwarded for DA/OSD approval on 30 September 1977.

Maintenance Interservice Support

(U) Under the guidance of the Joint Logistics Commanders' (JLC) Joint Policy Coordinating Group on Depot Maintenance Interservicing (JPCG-DMI), the Maintenance Interservice Support Management Office (MISMO), working in a joint Service environment, continued to act as a strong advocate to achieve increased interservicing of depot level maintenance support among the Services. During this period, the Service Interservice Liaison Officers (ILO) provided on the spot guidance and assistance to eleven multi-service, commodity oriented ad hoc work groups engaged in compiling information, preparing studies and making recommendations for interservicing common depot maintenance workloads.

(U) In October 1976, the JLC's signed a charter establishing a Maintenance Interservice Support Group - Central (MISG-C) to provide the necessary support for the joint MISMO's to carry out responsibilities concerning the coordination of depot maintenance interservice planning for new systems/items early in the acquisition phase. Consisting of 18 multi-service representatives (5 Army, 6 Air Force, 5 Navy, and 2 Marine Corps), the MISG was to be physically located at Tinker Air Force Base, Oklahoma.

(U) In January 1977, the MISMO's of the four Services approved 106 new interservice proposals, including four new starts. It was estimated that this action would result in interservice agreements covering an additional \$6 million of annual depot maintenance interservicing among the Services, with the four new start decisions representing a possible equipment cost avoidance of \$1.5 million.

(U) At a joint JPCG-DMI/MISMO meeting on 3 February 1977, discussions were held on several key subjects, including OMB Circular A-76 implementation and a Naval Air Systems Command new start instruction. The JPCG-DMI set aside criteria was reaffirmed and an AAU-31/32 Altimeter new start set aside paper, with justification prepared by the Army, was accepted as a matter of record. Likewise, agreement was reached that the JPCG-DMI new start dollar threshold be changed from \$25,000/\$50,000 to \$100,000/\$100,000, with joint service projects to be reviewed regardless of dollar thresholds. In addition, results of a special study effort (Army and Marine Corps) relative to equitable trade-offs was presented by the Vehicle Work Group, and its recommendation relative to retention of a status quo position was accepted by the JPCG-DMI members.

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(U) In continuation of a Depot Maintenance Interservice (DMI) joint Service action initiated in August 1976 through the Air Force, the Assistant Secretary of Defense (Comptroller) denied, in March 1977, a request to have the Defense Audit Service conduct an in-depth review of the hourly rate/cost disparity between the Air Force and Navy depot maintenance facilities affecting interservicing. In April 1977, the Comptroller of the Air Force advised the Air Force Logistics Command (AFLC) that the OSD decision would be appealed. Subsequent discussions between the Air Force and the OSD Comptroller resulted in OSD's agreement that the study would be conducted addressing the issue of allocation of overhead to direct cost. The Comptroller of the Air Force advised in a 22 June 1977 letter that the Defense Audit Service had been tasked with reviewing the rate structure as part of a broader review of the Services' depot maintenance accounting systems. This review should surface the rate variances, by type, between the Air Force and Navy.

(U) Responding to an OASD memorandum of 17 February 1977, a report on achievements made through 31 March 1977 in depot maintenance interservicing was forwarded on 6 May 1977 to OASD. The report highlighted the interservice studies/recommendations submitted by the eleven specialized ad hoc work groups. The recommendations resulted in 358 interservice decisions reflecting an annual potential of \$37 million in new interservicing and \$226 million in single service maintenance assignments. This was accomplished with the Depot Maintenance Interservice Support Agreement negotiations completed on approximately 33 percent of the decisions.

(U) In the aggregate, the ad hoc work groups had completed approximately 90 percent of their assignments. The number of common national stock numbers (NSN) reviewed as of 31 March 1977 were 23,708 and the number of service peculiar NSN's reviewed, based on common repair processes, were 19,335.

(U) OASD was also informed that pending activation and operation of a permanent Maintenance Interservice Support Group - Central, the ad hoc work groups would continue to perform studies on depot maintenance interservice new starts. That office was told that of the 358 decisions, 29 were DMI new starts with a \$6.8 million depot support equipment cost avoidance possible.

(U) Further, OASD was advised that experience had reconfirmed the original JLC assumption that new starts provided the greatest potential for hard core interservice economies and that for this reason the JLC had approved and chartered, on 13 October 1976, the establishment of the initial MISG. Over the long term, our goal was

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to institutionalize the interservice process to the extent that overall MISMO/ILO/MISG activities could be reduced to a monitoring/recording role with appropriate resource savings.

(U) By memorandum dated 27 May 1977, OASD expressed appreciation for the progress report, noted that the JLC efforts were encouraging and made the observation that actions taken and plans to review depot maintenance interservice new starts were particularly promising. An updated report was requested to be provided in November 1977, including the status of the MISG-C and results achieved. In addition, specific requests were levied on the Army and Navy Secretaries for information regarding depot maintenance interservicing of AIMS equipment. With DARCOM input, ASA (I&L) responded on 1 July 1977 to the latter request for the Army, with a separate Navy (I&L) response furnished on 15 August 1977.

(U) A General Accounting Office letter of 1 May 1977 to the Assistant Secretary of Defense (Comptroller) stated that the GAO was initiating a review of the management of aircraft depot maintenance resources and workloads within the Department of Defense. The Service MISMO's were visited by GAO staff members in conjunction with this review.

(U) On 15 June 1977, the MISMO's approved another 126 new interservice proposals for implementation. These decisions, including one new start with a cost avoidance of \$665 thousand, represented an additional potential of \$7 million in annual interservicing, and \$27.8 million in annual single service support.

(U) Representatives from the MISMO attended a meeting on 28-29 June at the Joint Tactical Communications (TRI-TAC) Office to review the status of planning for TRI-TAC equipments relative to interservicing of depot maintenance. It was determined that several of the equipments were already under DMI ad hoc work group review and that the FY 81-82 production time frame would permit the use of the MISG-C to provide a timely review and recommendations for the remaining equipments.

(U) An OASD memorandum to the Assistant Secretaries (I&L) of the Services, dated 29 June 1977, requested a report on the accomplishments of the Small Arms Work Group in the single servicing of depot maintenance of small arms. A summary report was prepared and forwarded on 19 August 1977 to OASD through the Assistant Secretary of the Navy (as lead Service).

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(U) A meeting of the Defense Integrated Materiel Management Non-consumable Item Subgroup (DIMM-NIS) and MISMO members was held on 14 July 1977 at which was reviewed the status of a joint effort to implement the program for elimination of duplication in the Management and Logistic Support of Multi-Used Nonconsumable Items. Also, a few interface discrepancies were surfaced with resolutions to be discussed at a subsequent meeting. It was agreed that an interface between the DIMM subgroup studying Interchangeable and Substitute Items should be established. As a result of this meeting, the MISMO's found it necessary to place a requirement on each of the work groups to resubmit a complete duplicate set of DZR cards to the MISG-C, with machine listings to the MISMO's for all DZR's which they had previously submitted to AFLC (LOI). These data were to be used to effect reconciliation of all work group actions and provide baseline documents for record.

(U) At a joint JPCG-DMI/MISMO meeting on 11 August 1977, a status report on staffing of the MISG-C reflected that the majority of the Service personnel would be on board in September/October and that it should be fully operational in December 1977.

(U) Estimated costs compiled of the MISMO/ILO/work group depot maintenance interservicing study effort reflected a total cost of a little over \$6 million as compared to an original program forecast of \$8 million.

(U) It was agreed that the DMI community should not be involved in the interservicing of software for operational programs. A 29 September letter from the JPCG-DMI to the Chief of Naval Material's JLC Secretariat member suggested that the Joint Policy Coordinating Group on Computer Resources Management look into operational software interservicing possibilities.

(U) An AFLC (MA) letter of 23 September 1977 was received by the MISMO's providing set aside justification for the AIM-9L Side-winder Missile based on technical competency, mission criticality, facility capacity/utilization, ability to surge and source of repair vulnerability. The set aside was reviewed by the MISMO's and retained for record purposes.

(U) As of the end of September 1977, a total of all inter-service decisions reflected approximately \$45.9 million potential for annual interservicing and \$258.7 million in single service support.

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CHAPTER VII

MATERIEL DEVELOPMENT

Development and Engineering

Executive Summary

(U) Certain elements of the Directorate continued to operate under critical personnel shortages. This was particularly true of the Systems Development Office (SDO). The experiment of filling the position of Associate Director with personnel on TDY for 60 days was found to be ineffective and will be abandoned in favor of a full time civilian (GS-16).

(U) A major reorganization in the Foreign Science and Technology area occurred with the combining with that office of certain functions dealing with Countermeasures/Counter-countermeasures (CM/CCM). Additionally, the office has been requested by OSD to provide long range equipment projections in selected areas. In the meantime, progress was being made in the specifications, standards and engineering field by revisions planned or underway of Army Regulations to reflect more precise definitions and guidance, to include international standardization.

(U) The Directorate mission of improving the exchange of information with industry made gains by the collocation of the three services' industry information offices in both Washington and the West Coast. Also, the Industry Independent Research and Development program management was improved, though the shortage of personnel, here too, hindered institution of certain new policies and procedures.

Industry Liaison

(U) Responsibility for the technical evaluation of 11 additional defense contractors' IR&D programs was transferred in 1974 from the Air Force to the Army. Concurrent with the understanding was that the second part of the IR&D process, that of negotiation of ceiling on dollar recovery, would be transferred as soon as practicable. The transfer of this latter responsibility, in which the Industry Liaison Office supports the Procurement and Production Directorate, was completed in the past year for Motorola, Chrysler, and AVCO Lycoming. It was expected that the negotiation responsibility for GM R&D Center, Martin Marietta (Orlando), and Boeing Vertol was to be completed early in 1978.

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(U) These actions resulted in significant improvements in the administration of the IR&D program, since the Air Force procedures were quite different from the Army's. The transfer will also require action by this office to determine the proper classification of contractor efforts, whether IR&D, bid and proposal, or indirect engineering. Present Army (Industry Liaison Office) responsibility for the technical evaluation covers 25 defense contractors.

(U) During the period covered, this office conducted on-site reviews of contractors' IR&D programs at ten plants. Seven of these were the executive management type of review which was initiated by this office for Army use in 1975. This approach, prompted by DDR&E emphasis on eliminating duplication in technical evaluation and reduction in the cost of IR&D administration, has proven successful. It provided the insight necessary to the complete evaluation, at low cost to the Army, and was achieved with a minimum of technical personnel. In general, industry accepted it with enthusiasm. Because of the small number of people involved (normally six to eight DOD and four to six contractor), highly effective DOD-Industry technical interfacing was achieved. Army influence on IR&D contractors' programs were also enhanced. This was considered to be of great benefit to Army RDT&E programs, as the contractors addressed more Army objectives and requirements in their IR&D projects.

(U) Because of the radical reorganization in DARCOM major subordinate commands, there were numerous changes in the IR&D focal points which supported this office in the administration of the Army's part of this DOD function. Efforts to familiarize the newly assigned personnel with IR&D procedures had not always produced expert coordinators. Technical inputs were late and inadequate, with some impact on the total evaluation and negotiation. Efforts will be increased to expedite training these individuals in the complicated procedures and policies of IR&D.

Foreign Science and Technology

(U) Reorganization Actions. A new thrust was established in DRCDE-F which combined the Systems Development Office resources of the Development Manager for Countermeasures/Counter Countermeasures (CM/CCM) and the HQ DARCOM Foreign Intelligence Office (FIO). In consonance with last year's tasking by Department of the Army (DA) to establish a center of excellence for CM/CCM, a Harry Diamond Laboratories (HDL) TDA was approved at DARCOM in February 1977 authorizing five officers and 19 civilians, with the Director being an O-6. This office was tasked to perform as the DARCOM CM/CCM focal point for ensuring that technical CM/CCM were properly considered throughout the materiel acquisition and life cycle processes. The DARCOM/TRADOC

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management approach to CM/CCM problems was approved by DA. Initial funding for this office was obtained from the SAM-D VSO budget line. Beginning with FY 1979, funds were to be provided from a new program element. On 5 July 1977, operational control of the Center was transferred from HDL to ERADCOM (P) where it will continue to perform an independent CM/CCM assessment office for DARCOM. The Office of the Associate Director for Foreign Science and Technology absorbed, with no additional resources, the functions of the HQ DARCOM FIO. This was a gradual change brought about through the development of a separate FIO Office via retirement and the return of rotational assignees. DRUDE-F retained a small portion of Foreign Materiel Exploitation (FME) management during the past year.

(U) Long Range Projection Requirements. The general situation in the world, with regard to US interests, deteriorated over the past year with the significant increases in European and Asian Communist countries strength and quality of forces. This situation was recognized and a resultant surge occurred in the demand for intelligence. The nature of the intelligence required was of the type which addressed the major issues. Defense Intelligence Agency (DIA) directed the Army Foreign Science and Technology Center (FSTC) and Missile Intelligence Agency (MIA) to provide long range equipment projections in the areas of combat support, combat vehicles and infantry weapons systems. Taskings in the missile and ground forces areas were in final processing.

(U) Net Technical Assessment. Foreign Science and Technology integrated a new function of net technical assessment during the year. Through this function it is hoped that a tool for measuring, comparing and projecting RED/BLUE technology can be developed for input to our base technology programs.

Systems Evaluation and Testing

(U) Congressional and OSD concerns by mid-CY 1976 regarding Army laser weapons led to intensive management by DARCOM headquarters. The Deputy Commander of Materiel Development chartered an individual in the Development and Engineering Directorate in August 1976 to perform this function under the title - DARCOM Focal Point (DFP) for Ground Laser Designators (GLD).

(U) Although the expressed concerns included credibility, duplication, weight, costs and survivability, the principal driver was the requirement that each laser designator be tested under field conditions against the guidance requirements of laser guided munitions of all the Services before procurement. Weapon firings to achieve this objective would have been prohibitive because of the quantities that would have

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been required, their costs and the time that would have been needed. Existing simulation was either primitive or was of limited utility. Since August 1976 management changes, coordinated technical performance of laser weapons and designators, and validated costs of designators improved credibility and greater understanding among the Services. Also established were the architecture for accomplishing the necessary activities, together with the instruments necessary to maintain the improvements gained. The principal capabilities developed to overcome the limitations to laser designator procurement are described in the succeeding paragraphs.

(U) Through the combined activities of DARCOM agencies, Project Managers, other services (Marine Corps, USAF) and private industry, a simulation effort was started in October 1976 that encompassed the man, the designator, the designated target, the environment of spurious reflectors, the atmosphere, the seeker's target selection logic as well as the kinematics and dynamics of the projectile. The simulation that treated these effects was called the Laser Designator Weapon System Simulation (LDWSS).

(U) Many fundamental accomplishments were made during Phase I. Overall achievements included the ability to assess weapon performance in the presence of spillover; the ability to separate man from the environment; and the ability to relate individual subsystem performance parameters to overall weapon behavior in a complete and controlled experimental device.

(U) Phase II, which was underway, was to refine hardware system inputs, validate physical sub-models, correlate the LDWSS against real flights, simulate degraded environments (reduced target exposure, atmosphere, smoke, etc.), establish working interfaces with independent evaluators, establish working utility with laser weapon developers of the other services, and provide input to the for-on-force analysts.

(U) Associated with these activities was the establishment of a management instrument to assure that a total system viewpoint was continuously addressed. This led to the establishment of a Board of Directors composed of those having the most need as well as capabilities to accomplish the activities. This Board was chartered by the Deputy Commander for Materiel Development and included management, resources, and reporting criteria. The Board consisted of four Terminal Homing Project Managers (COPPERHEAD; HELLFIRE; Ground Laser Designators; Target Acquisition Designation System) and the MIRADCOM Director of Technology Laboratories as Chairman.

(U) These accomplishments included the development of a tool that permitted design performance assessments and trade-offs, and

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identification of data requirements for test operations. When this tool was combined with weapon firings, it provided a means of assessing integrated weapon performance. Further, a mechanism was developed that had real potential for total overview of several systems, preventing problems arising, unrecognized or unattended, due to their falling partially or completely outside the area of responsibility of one individual project manager. Efforts resulted in an instrument for coupling developers, technologists, and analysts.

Systems Development

(U) Personnel Actions. The Systems Development Office (SDO) began the fiscal year without benefit of an assigned Associate Director. Mr. Richard J. Happick was Acting Associate Director, having relieved Mr. William T. Hunt after his detail had expired. Two more civilian Acting Associate Directors were appointed, Mr. Carroll Ruben (Dec 76 - Jan 77) and Mr. George T. Myers (Feb 77 - Mar 77). In March 1977, the Director, Development and Engineering determined that the turbulence created by the limitation of being able to detail civilian personnel to head the SDO for 60 days was detrimental to its performance. At that time, it was determined that the position of Associate Director would be filled by a military person until assignment of a GS-16. COL James F. Bleecker was appointed Acting Associate Director in March 1977 and was acting in that capacity at the end of the fiscal year. The SDO also continued to be short of other critical personnel although three new Development Managers: COL Clifford Jones, Jr., COL Edmund A. Thompson, and COL Ashby F. Collins were assigned during the summer of 1977 along with Dr. James J. McLeskey, assigned as the General Engineer, SDO Headquarters. At the end of the fiscal year, one military and two civilian vacancies existed.

(U) Despite the personnel turbulence, the SDO began to shake down its operations under the new "corporate posture." Major effort was expended in preparing recommendations to the Director on program management and technical problems on a case-by-case basis, monitoring the execution of the FY 1977 RDTE program, preparing recommendations for the development of the FY 1978 RDTE program, and monitoring over 300 projects. During the fiscal year, the SDO processed for approval by the Director, 26 Letters of Agreement (LOA), six Required Operational Capability (ROC), six Letter Requirements (LR), 13 Training Device Requirements (TDR), and 23 Training Device Letter Requirements (TDLR). The SDO prepared a new Army regulation on Type Classification of Army Materiel for DA approval and participated in the development of a new AR 1000-1, Basic Policies for Systems Acquisition. Other significant activities were:

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(U) Automatic Test Support System (ATSS) Task Force. An Automatic Test Support System (ATSS) Task Force assembled in January 1977 to consider the best strategy for the development and procurement of computer controlled automatic test equipment (ATE). A Steering Group chaired by the Director, Development and Engineering and consisting of general officers from HQ DA, TRADOC, DARCOM, and other interested agencies, was established to guide the Task Force's efforts. These activities resulted from a realization that automatic testing was becoming an essential part of a greatly increasing number of programs, that the potential cost of test-related hardware, software and support requirements was enormous, and that an uncontrolled proliferation of systems would occur if some form of management were not applied. The Task Force produced findings and recommendations that accommodated both the near-term acquisition of ATE to support deploying systems and the longer-term development of an advanced system that could provide broad support throughout the Army.

(U) Management of Computer Resources. The requirement for more effective management of computer resources in Army Defense Systems was highlighted by the issuance of a DOD directive on the subject. DARCOM was tasked, and this Directorate developed an Army-wide implementation plan which was approved on 22 March 1977 by OSD. Headquarters, DA directed DARCOM to implement the plan on 7 September 1977. The Development and Engineering Directorate had the overall responsibility for the development, coordination, and Army-wide implementation of computer resources management policy and procedures for the Army Defense Systems and for the submission to HQ DA for approval of the Army Research and Development Technology Base Program for Computer Resources in support of Army Defense Systems requirements. Initial efforts in implementing the plan consisted of the preparation of a new draft Army regulation on computer resource management, development of guidelines to incorporate computer resource management requirements into the current Life Cycle Management Model, the development of new policy and procedures for computer software test and evaluation, and the development of a series of guidebooks and standards to assist development and readiness personnel in dealing more effectively with computer resource problems on a total life cycle basis.

Specifications, Standards, and Engineering.

(U) Mission. The mission of the Associate Director for Specifications, Standards and Engineering (DRCDE-E), Directorate for Development and Engineering, provides for the management of selected engineering activities. The selected activities are: Standardization, Parts Control, Scientific and Technical Information Systems, Government/Industry Data Exchange Program, Technical Data Management and Configuration Management. DRCDE-E TDA consists of one GS-15, seven action

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officers, three GS-14, two GS-13, and GS-12 and one grade (general engineer) undetermined. All positions are filled, with exception to the position with the undetermined grade which was added when the Configuration Management function was transferred from DRCPI in the fourth quarter of FY 1977. Listed below are significant events which occurred in FY 1977.

(U) Scientific and Technical Information (STINFO). Revision was completed to AR 70-31, Standards for Technical Reporting, which prescribes policies, procedures, responsibilities, and standards for the origination, preparation, review and dissemination of technical information. This is currently in coordination and expected to be published in FY 1978.

(U) A draft AR 70-XX was completed, covering Technical Libraries, Information Functions, Information Centers, and Information Analysis Centers. The new AR will prescribe policies and procedures for the establishment and operation of Army scientific and technical libraries, information facilities, centers/activities and interactive terminals which send, receive, display/print electrically accessed information. The draft AR is currently in coordination and scheduled for publication in FY 1978.

(U) The office assisted in the plans and management of an international conference with US and NATO allies to recognize and encourage the benefits of technology transfer through economic strength and military power. The conference, titled "Technology Transfer in Industrialized Countries," was to be held in Estoril, Portugal, from 7-11 November 1977.

(U) Government/Industry Data Exchange Program (GIDEP). During FY 1977 the Army continued as an active participant in GIDEP for which it funded \$415,000. The Aviation Depot Maintenance Information Transfer Program (AMIT) was initiated as a specialized data bank operated by the GIDEP Operation Center.

(U) Technical Data/Configuration Management System (TD/CMS). The development and test of DARCOM standard TD/CMS was completed and guidance was provided by letter to DARCOM subordinate activities for implementation. This program was a part of the Commodity Command Standard System (CCSS).

(U) Technical Data Program/Acquisition Management Systems and Data Requirements Control Program. DRCDE-E provided the Army member to the DOD Management Information Analysis Group (MIAG) which was charged with the responsibility to develop new policies and procedures for controlling the development of the acquisition and data requirements and their application on DOD contracts. In FY 1977, MIAG published the following documents:

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(U) DOD 5000.19-L, Vol II, DOD Acquisition Management Systems and Data Requirements Control List (AMSDL), which contained the list of Acquisition Management Systems (Source Documents) and Data Item Descriptions (DID) and Unique Data Item Descriptions (UDID) available for contractual application.

(U) DOD Manual 5000.32M (Draft), Acquisition Management Systems and Data Requirements Control Program Manual, which contained policies and procedures to achieve greater effectiveness, efficiency and economy in the acquisition process.

(U) Defense Standardization Program (DSP). The extensive reorganization of the DARCOM commands recommended by AMARC (Army Materiel Acquisition Review Committee) was continuing with the resultant increase in the number of standardization offices. For example, at the Tank-Automotive Command, both the research and development (TARADCOM) and the readiness (TARCOM) commands had standardization elements. Six R&D commands and four materiel commands were established; two more R&D and one readiness command were being developed from the Electronics Command. A standardization element also existed at the Test & Evaluation Command and the Depot System Command. Alignment of the DSP elements at these new commands created some difficulty due to personnel and budgetary restrictions.

(U) The new Defense Standardization and Specification Program Directive 4120.3 was not signed out at the Assistant Secretary of Defense level due primarily to reorganizations there which will place the DSP responsibility with the Director of Defense Research and Engineering rather than ASD (Manpower, Reserve Affairs and Logistics). At the same time, the ASD(I&L) and Assistant Secretary of Army (I&L) were disestablished. Additionally, memos from the ASD (Comptroller), such as Acquisition Management Systems and Data Requirements, to the Secretaries of the Military Departments will impact on the DSP and policies from the Secretaries have not filtered down to DARCOM. Such memos may require changes to the 4120.3 directive and manual. The revised manual was in final stages, prior to coordination, and had been held up until the directive was signed. However, several DSP directives and instructions in the 4120 Series were issued and implemented by Army Regulations. They included Specifications and Standards Application, DOD Parts Control System, Use of Metric System of Measurement, and Development and Use of Non-Government Standards. The AR 700-47, Defense Standardization Program, had been drafted for a revision, but must of necessity await the issue of the 4120.3 Directive.

(U) The budget for the Army portion of DSP has remained in the \$12 million range for over 10 years with attendant manyear reductions from 1200 to 400 due to salary and inflationary increases. Utilizing

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the Zero Base Budgeting concept, an additional \$9.5 million was requested through comptroller channels to accomplish the new initiatives directed by OSD. This amount was prioritized into \$3 million for urgent standardization efforts and \$6.5 million of lower priority DSP work to be accomplished by contract. This office worked closely with OSD counterparts to have the DSP detailed in the Planning and Programming Guidance Memorandum to improve visibility and management of DSP resources, since indications are the requested Army funds will not be provided at a sufficient level.

(U) DOD MIL-STD-965, Parts Control Program, which provides unified procedures for parts control was developed and published on 15 April 1977. It superseded four military standards covering parts control in their entirety and portions of other specifications and standards which contained parts control procedures.

Programs and Budget

(U) Future Year Operations. The US DARCOM Five-Year RDTE Program for FY 1979-83 was submitted to the Deputy Chief of Staff for Research, Development and Acquisition, Department of the Army, in January 1977 as follows:

(Thousands of Dollars)

| <u>FY 79</u> | <u>FY 80</u> | <u>FY 81</u> | <u>FY 82</u> | <u>FY 83</u> |
|--------------|--------------|--------------|--------------|--------------|
| 2,286,173 | 2,100,186 | 1,915,840 | 1,773,130 | 1,790,674 |

(U) The Deputy Chief of Staff for Research, Development and Acquisition, Department of the Army, in the Research, Development and Acquisition Committee with other DA Staff reviewed the DARCOM program and changed it as of 6 May 1977 as shown:

| <u>FY 79</u> | <u>FY 80</u> | <u>FY 81</u> | <u>FY 82</u> | <u>FY 83</u> |
|--------------|--------------|--------------|--------------|--------------|
| 2,233,490 | 2,245,632 | 2,257,625 | 2,277,087 | 2,174,001 |

(U) In January 1978, the FY 1979 program will be presented to Congress.

(U) Program Control. The FY 1977 RDTE Program Apportionment Request, September 1976 was \$1,830.3 million. As of 30 November 1976 the RDTE Program released to DARCOM totalled \$1,765.1 million. During FY 1977 this office reviewed on a quarterly basis 16 Selected Acquisition Reports for submission to DA, OSD and/or Congress.

(U) The implementation of the Secretary of the Army proposal to establish a concept known as Total Risk Assessing Cost Estimate (TRACE)

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has been increased from eight projects in FY 1977 to 19 projects in FY 1978. Computation methodology originally outlined in a Department of the Army (DCSRDA) Letter of Instruction (LOI), dated 6 March 1975, was revised to allow a standardized computer application and increase accuracy in identifying risk element and related increased risk capital to provide for uncertainties should unknown risks occur.

(U) RDTE Program Reviews past traditions/practice of having face-to-face reviews with major subordinate commands, project managers (PM) or laboratories in the January/February time frame were cancelled in an attempt to reduce reviews (from two to one) and select an optimum time for what was anticipated to become an annual program review (May - June time frame).

(U) The DRCDE-P continued to provide support to the School of Logistic Science of the Army Logistic Management Center (ALMC) by providing guest speakers and technical assistance for the cost estimating for engineers, decision risk analysis, and research and development management courses currently being conducted at the ALMC.

(U) In an effort to modernize the RDTE reporting system, DA has developed an automated Modernized Army Research and Development Information System (MARDIS). The system included a Program Data Form (PDF) for data capture, which replaced manually prepared forms supporting the budget formulation, phase scheduling, and apportionment processes. Prototype testing was conducted during 1975-76 at MERADCOM and NARADCOM. After conversion to the prototype MARDIS, interviews were conducted with key functional personnel to determine system impact on job function and to verify effectiveness. Although the economic analysis supported implementation of MARDIS Army-wide, certain inefficiencies, mainly in updating the system, came to light during the interviews. Testing was completed and MARDIS was awaiting approval of the ASA I&L. After approval it will be scheduled for extension throughout DARCOM.

(U) Program Execution. Program data to support the 1979 RDTE President's Budget was prepared in accordance with Zero Base Budgeting procedures directed by the President.

(U) Support material for inclusion in the FY 1978 RDTE Apportionment Request was prepared and forwarded to higher authority. The support material included data for the basic FY 1978 RDTE program and all anticipated RDTE carryover funds into FY 1978. All data submitted was based on information furnished by the major subordinate commands and laboratories adjusted to conform with the latest program guidance from higher authority.

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(U) The FY 1977 RDTE funding document (DA Form 1323) was received in August 1976 from the Comptroller of the Army. After receipt of funds, program directives (AMC Form 1006) were released to the field to cover the approved plan for each project and/or task. These Forms 1006 were forwarded to the Finance and Accounting Division, Comptroller, DARCOM, along with Schedule I and AMC Forms 20 requesting issuance of funds to the major subordinate commands and laboratories.

(U) Program directives were issued throughout the year for the current and prior fiscal years. These program directives were used to reprogram, issue released funds and withdraw unobligated funds excess to current requirements. An average of approximately 10 program directives were issued each working day. In addition to this, numerous program revisions for each subordinate command were processed within this headquarters and approvals returned to the subordinate commands.

(U) In FY 1977 DARCOM Subordinate Commands, Independent Corporate Laboratories, Project and Product Managers again operated under the concepts and principles of incremental funding.

(U) Through a concerted SCORECARD effort, reports began in October 1976 on a monthly basis. Subordinate commands and independent activities reported their unobligated balances of the FY 1976/77 carryover program as well as their FY 1977 unobligated balances at project level. As of the eighth and eighteenth working day of January 1977 this status of funds was reported on a biweekly basis. Beginning in May 1977 reports were telephoned to Headquarters, DARCOM on a weekly basis.

(U) The total unobligated balance for FY 1977 as of 30 September 1977 was \$82.1 million.

(U) The following chart reflects the total FY 1977 program and prior years unobligated amounts which were carried over for each major subordinate command and separate activity (HQ DARCOM) as of 30 September 1977

| <u>COMMAND</u> | <u>PROGRAM</u> <u>(\$1,000)</u> | <u>UNOBLIGATED</u> <u>(\$1,000)</u> | <u>PLANNED CARRYOVER</u> <u>FY 77 FUNDS (\$1,000)</u> |
|----------------|------------------------------------|--|--|
| ARRADCOM | 202.5 | 7.9 | 7.9 |
| AVRADCOM | 309.2 | 21.5 | 21.5 |
| ERADCOM | 242.0 | 18.5 | 18.5 |
| MIRADCOM | 488.4 | 9.1 | 9.1 |
| TARADCOM | 189.3 | 4.3 | 4.3 |

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| <u>COMMAND</u> | <u>PROGRAM</u> <u>(\$1,000)</u> | <u>UNOBLIGATED</u> <u>(\$1,000)</u> | <u>PLANNED CARRYOVER</u> <u>FY 77 FUNDS (\$1,000)</u> |
|----------------|------------------------------------|--|--|
| TECOM | 170.3 | 4.6 | 4.6 |
| MERADCOM | 34.7 | 1.0 | 1.0 |
| NARADCOM | 22.1 | 1.9 | 1.9 |
| DARCOM HQ | 167.1 | 13.4 | 13.4 |

(U) Through the SCORECARD reporting system, this headquarters continuously assessed the progress of each command toward meeting an obligational goal established by the subcommand and/or activity, and to present up-to-date, meaningful briefings to Headquarters Staff.

(U) During FY 1977 the Associate Director for Programs and Budget was tasked to assemble and have published the Department of Defense In-House RDTE Activities Report. Prior to the assignment to DARCOM this publication was a function of ODCSRDA.

(U) During FY 1977 this office transferred all non-AMC RDTE Customer Orders, with the exception of DARPA Orders, to the major subordinate commands and laboratories where orders were performed in accordance with the respective missions.

Manufacturing Technology

(U) The Office of Manufacturing Technology (OMT) was established in January 1976 with the mission to assure that new or improved manufacturing processes, techniques, materials and equipment, were used for the efficient development and production of new or existing items in the Army materiel inventory.

(U) Accountable directly to the DARCOM Deputy Commanding General for Materiel Development, the OMT was established as a high level, professional group of eight engineers and scientists, representing the major disciplines. COL Newell E. Vinson was designated as Acting Chief and in 1977 as Chief.

(U) The OMT was initially designed to be staffed by a GS-16 Chief, two GS-15, seven GS-14, one GS-12 engineers, and three secretaries. Problems in acquiring the high level staff desired by management, caused a realignment to take advantage of the particular expertise available. As a result, a Colonel was placed in charge, and by the end of CY 1977, it was to be completely staffed with ten engineers covering all the major disciplines.

(U) Office goals were in line with objectives set forth by former Assistant Secretary of Defense William P. Clements, in directives and guidance documents issued in 1975 and again in 1976.

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The OMT was supported by the Manufacturing Technology Division of the Industrial Base Engineering Activity (IBEA) and the Technology Transfer Division of the Army Materials and Mechanics Research Center (AMMRC).

(U) For nearly two years, the OMT has been actively engaged in managing manufacturing methods and technology programs, in identifying critical technologies, in promoting technology transfer and information exchange through Manufacturing Technology tri-service/industry meetings and in sponsoring projects for reducing production costs, project lead times, dependence on critical materials and energy consumption, improving pollution abatement, and enhancing the speedy use of metrication.

Policy Highlights

(U) In Value Engineering (VE), project managers were redirected to report their VE efforts separately from the commands to which they were assigned, and to change from monthly to quarterly reporting as this frequency was considered to be adequate.

(U) For materiel being acquired under the Commercial Commodity Acquisition Pilot (CCAP) program the OMT, working with DA Policy Branch (DAMA-PPM-M), clarified that purchase specifications may be waived in acquiring materiel differing in some respects from that previously procured, but that requirements may not be waived.

(U) In technology transfer, continued emphasis was placed on the publication of the Manufacturing Technology Journal, of Tech Notes which give subscribers to the Department of Commerce NTIS, brief one-page synopses of new areas of technology having broad industrial applications; and manufacturing technology bulletins designed to disseminate recent accomplishments quickly to members of the three services.

(U) Also, the JLC's Design to Cost (DTC) sub-panel chaired by OMT for the Army, completed its assignment and, following its report to the Production/Manufacturing Panel, was abolished.

Organizational Resources

(U) Efforts were initiated late in FY 1977 to identify the specific areas where approximately \$40 million annual PEP funding is applied, to correlate PEP moneys with total system R&D cost or complexity, to identify and, if possible, quantify the return on PEP funds invested.

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(U) Manufacturing Methods & Technology (MMT). Funding was cut back from \$75.4 million in FY 1976 to \$60.4 million in FY 1977 despite the urging of DepSecDef Clements and the FY 1977-81 PPGM that "each service (was to) give this program increased emphasis" and that the "Army's funding supporting the "Aircraft," "Missiles," "Weapons and Tracked Vehicles," and "Other" appropriations will be increased in FY 1977 and each subsequent year with a goal of \$60 million per year for FY 1981 and FY 1982." This reduction was largely due to the cutback of Appropriation IV - Ammunition, from \$41 to \$26 million by the House Armed Services Committee.

(U) Of the \$46.4 million OMA P7S funding for Production Engineering (PE) \$17.3 million is for stock funded items and represents a \$1 million increase over FY 1976. The remainder was in support of procurement items and was reimbursable.

Programs and Events

(U) The major programs in the OMT were in terms of intensifying the use of PEP (IV D2), identifying PE programs by commodity (IV D1), establishing evaluation criteria for MMT projects (IV D3), participating and providing leadership to the Technology Export Control program (IV D4), participating in the Commercial Commodity Acquisition Pilot Program (IV D5), and in stimulating energy conservation, pollution abatement and safety projects as well as the ever important cost reduction aspects in MMT programs (IV D8).

(U) During FY 1977, the major events for the OMT included the meetings chaired by OMT personnel and arranged in conjunction with the staff at AMMRC and IBEA. These were:

| | | |
|---|---------------|-------------------|
| Tank-Automotive | October 1976 | Dearborn, MI |
| Manufacturing Technology Advisory Group | November 1976 | Arlington, TX |
| Metal Chip Removal | February 1977 | Daytona Beach, FL |
| Electronics | March 1977 | Cherry Hill, NJ |

(U) In addition the OMT participated in the Joint Logistics Command (JLC) tri-service production and manufacturing panel, assumed responsibility for chairing sub-panels on producibility, value engineering, and on training, and participated in several other panels.

Organizational Changes

(U) Effect of Regulations. OMT was affected most tellingly in its operations by change 1 to AR 700-90, chapter 3, implemented in April 1977. The effect of this change was to redefine what could be

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done with RDTE, PA, and OMA funds in Manufacturing Technology (MT) projects. Action had been underway since April 1977 to assess the possible conflict of this AR change with other existing regulations and the DOD Budget Guidance Manual, which affect manufacturing technology.

(U) Manufacturing Methods and Technology (MM&T) and Military Adaptation of Commercial Items (MACI) programs were all initially Procurement, Army (PA - formerly PEMA) funded in each major commodity area as follows:

| <u>Appropriation</u> | <u>Activity</u> | <u>Commodity</u> | <u>AMS CODE</u> | |
|----------------------|-----------------|----------------------|-----------------|-------------|
| | | | <u>MMT</u> | <u>MACI</u> |
| I | | Aircraft | 1497 | 1498 |
| II | | Missiles | 2597 | 2598 |
| III | 1 | Tracked Cbt Veh | 3197 | 3198 |
| | 2 | Wpns & Other Cbt Veh | 3297 | 3298 |
| IV | | Ammunition | 4950 | 4960 |
| V | 1 | Tac & Spt Veh | 5197 | 5198 |
| | 2 | Commo & Elec | 5297 | 5298 |
| | 3 | Other Spt Equip | 5397 | 5398 |

(U) OMT engineers were assigned to cover all of these major commodity areas and, with personnel from IBEA and AMMRC, review and recommend for approval or rejection each MMT project submitted.

(U) The major impact of the cited change in AR 700-90 was to restrict those MMT & MACI projects which could be procurement funded. Change 1 limited the pre-procurement acquisition of initial evaluation quantities of non-developmental MACI items which met a new or changed requirement to RDTE funding.

(U) OMA P7S funded Production Engineering programs were not affected by the change except for the change in nomenclature, calling all of the MT program PE programs.

(U) Technology Transfer (TT). In addition to assigning staff by commodities they were assigned to cover the PEP, MMT and PE areas described above, plus Value Engineering (VE), and TT. For this latter function the previously cited Tech Transfer Division of AMMRC had been tasked to support OMT. This activity included the preparation for meetings and arranging for the publication of the MT Journal.

(U) The MT Division of IBEA, in addition to their critical MMT project review and recommendation function, supported OMT by publishing

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periodic MT Bulletins for the use of MT personnel in the three services, and Tech Notes which are issued to industrial subscribers through the Department of Commerce National Technical Information Service.

(U) In addition to publications and conferences the transfer of technology was accomplished through training courses which had been given on a regularly scheduled basis by AMETA at Rock Island, Illinois, by ALMC at Ft Lee, Virginia, and by the Red River Training Center at Texarkana, Texas.

(U) Production Engineering Service Office (PESO). Staffing of a PESO adjunct with two GS-14 engineers and a secretary during FY 1977 was designed to provide engineering support to assure that a developed item was ready for production. This review responsibility was being transferred from the Defense Logistics Agency (DLA) to the DARCOM OMT.

Major Trends

(U) Value Engineering (VE) and Design to Cost (DTC). In spite of the absence of dedicated funds to accomplish Value Engineering, the Office of Manufacturing Technology (OMT) emphasized the use of VE methodology to maximize the submission of contractor Value Engineering Change Proposals (VECP) as well as in-house Value Engineering Proposals (VEP). For example, fifteen DARCOM project managers whose involvement previously in the VE Program was not directly managed by OMT became active participants in addition to the subordinate commands and depots. For FY 1977, the subordinate commands accomplished 133 percent of their in-house Value Engineering Proposal (VEP) objective of 635 for a total of 839, and 95 percent of their contractor Value Engineering Change Proposal (VECP) objective of 533, for a total of 506. This performance together with the initial PM effort represented a total of \$74.5 million validated first-year-after-implementation, cost avoidance/savings to DOD. The Depots met 98 percent of their VEP objective of 660 for a total of 649, and accumulated \$16.0 million first year cost avoidance/saving to DOD.

(U) The use of the value engineering methodology continued to be stressed and efforts were made to try to identify funds which could be used to employ VE methodology during the design to cost phase.

(U) Manufacturing Methods & Technology (MMT). The trend for MMT projects in FY 1977 was for an increase in both the total number of projects submitted and those funded as shown in Charts 19 and 20.

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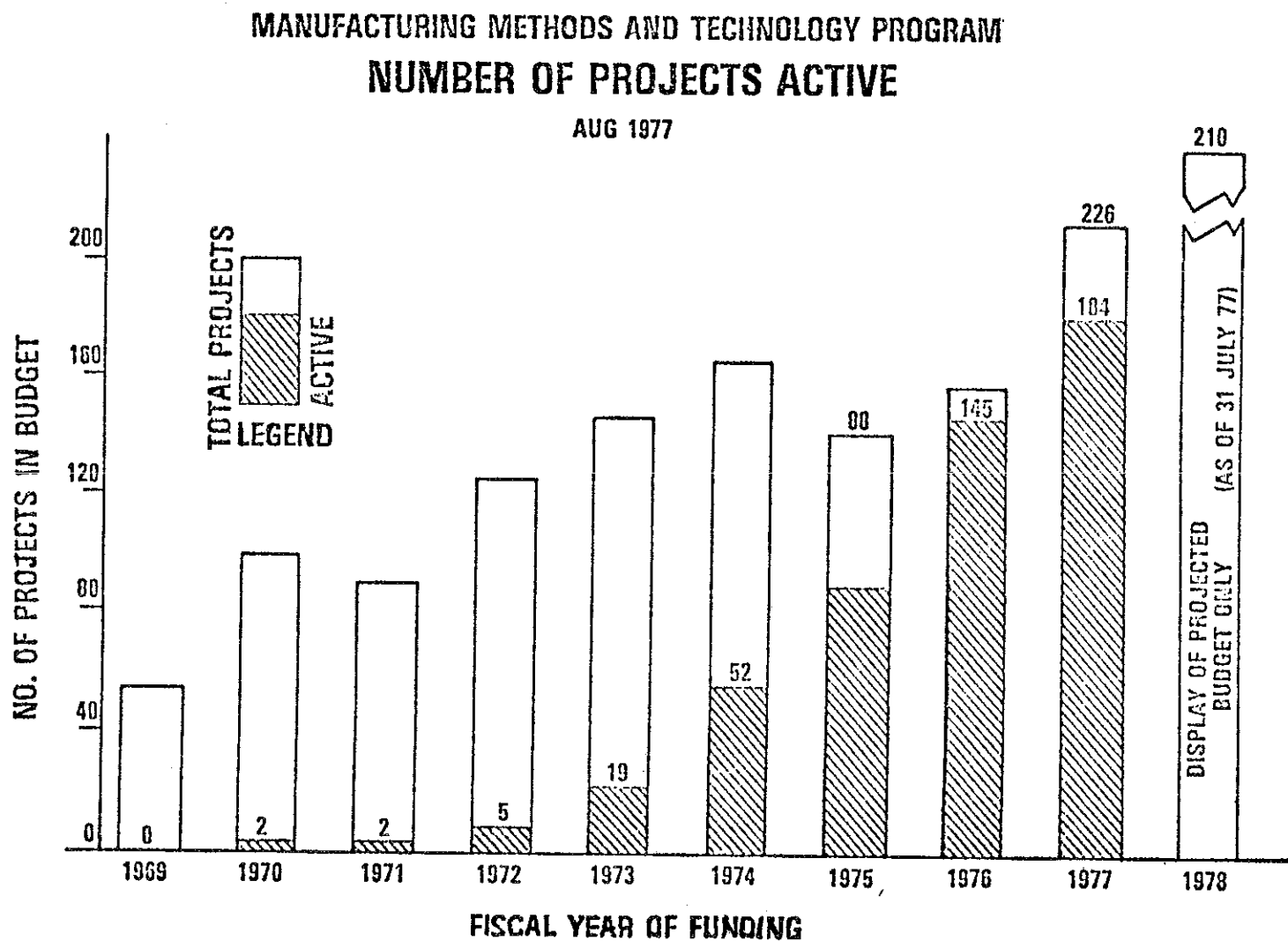


Chart 19

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FY 77-82 CURRENT MM&T FUNDING PLAN & DESIRED GROWTH

SOURCES:

FY 77 Current DA Guidance

FY 78-82 RDAC

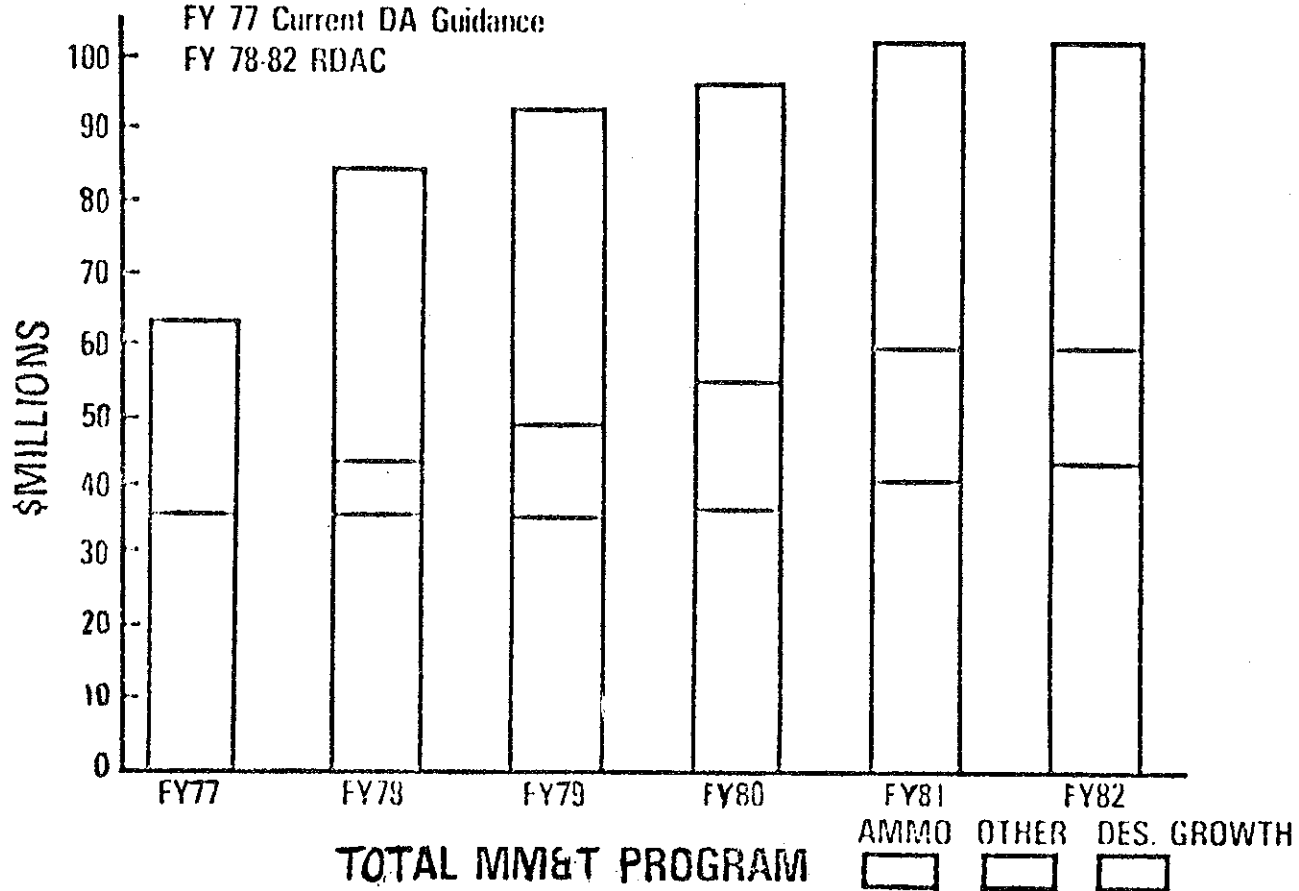


Chart 20

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Also, the funding level was down in FY 1977; however, the trend in the outyears looked promising. See MMT funding chart.

(U) Production Engineering (PE). The trend for OMA P7S funding for production engineering showed an annual increase in the 728012.12, 16, and 19 categories. PE in support of Military Uniforms, 728012.17 was added as a discrete line in FY 1977.

New Developments

(U) Production Engineering Management. Unlike the detailed project allocation prioritization and review procedure cited in IV B1 for MMT projects, non-reimbursable PE bulk funding requests of up to \$4 million were submitted by individual major commands and bulk funded by DARCOM to the extent funds were available for a total of \$16 to \$18 million annually.

(U) OMT tasked each command in FY 1977 to provide a breakout, allocating their planned PE supporting funds and personnel to specific commodities or programs. This was accomplished and the data was organized to permit allocation of project priorities among programs as was done in MMT. It was planned to bring together representatives from each command to attain a common level of excellence in the reporting to permit proper and rapid allocation of funds to areas of greatest need and return on investment.

(U) Producibility Engineering and Planning (PEP) Management. PEP programs were funded at the discretion of each Commander and Project Manager to the degree and extent he considered advisable within the constraints of RDTE funds he receives. In FY 1977 the OMT initiated an effort to identify the extent of PEP funding and to intensify the use of PEP prior to entering production or submitting MMT projects. In addition, an effort was made to identify and, if possible, quantify the return one might achieve from a PEP investment. This action was still underway.

(U) MMT Projects Evaluation Methodology. Although individual MMT projects were well documented by the P-16 format required for each submission, there was no sound technique available for attaching quantifiable rating factors to each project. As a result, the ranking of projects and the selection of which ones could be funded within prevailing dollar limits has always been somewhat subjective and biased. In an effort to permit objective prioritization of MMT projects, the OMT introduced an evaluation technique which would allow the unbiased allocation of rating factors by knowledgeable reviewers, a balancing of divergences using iterative reviews and a listing which was defensible at any level of review. This methodology was used during the FY 1978 apportionment reviews and with some refinements, blending inputs from both IBEA and AMMRC, will be used in MMT project reviews in the future.

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(U) Technology Export Control (TEC). The OMT has participated intensively as Army Technology Transfer Working Group 1A representative on the Technology Export Control Committee in support of the Defense Science Board Task Force concerned with TEC. One hundred twenty-five strategically significant technologies were identified and described by major sub-commands. Based upon a system proposed by OMT and adopted by the other services these technologies were solicited, collected, culled and submitted to the committee. This was part of an iterative review process in which OMT was actively engaged.

(U) Commercial Commodity Acquisition Program (CCAP). A CCAP pilot study was set up based upon the urging and interest at the highest level of ODDR&E and OMB. The OMT had served as the Army representative, along with representatives of the other services, Defense Logistics Agency, Office of Federal Procurement Policy, OMB, National Bureau of Standards, and others. This group had been trying to implement a policy for rapid acquisition of commercial products which could be bought to commercial specifications or brief one paragraph military Procurement Identification Descriptions (PID) for items in common usage in the non-military sector.

(U) The purpose of the CCAP was to significantly increase the percentage of Defense requirements to be satisfied through the acquisition of commercial "off-the-shelf" products and services. This program intended to maximize the use of items sold in the public market place, encouraging and evaluating new technological innovations, eliminating unnecessary government specifications, and exploring logistics alternatives; i.e., contractor vs organic support and use of commercial distribution systems.

(U) The objectives of the policy and guidelines were to reduce the cost of ownership by (1) avoidance of unnecessary expenditures of R&D funds and use of in-house R&D resources, (2) reducing procurement costs for supplies, and (3) reducing the costs of logistics support.

(U) International Technology. A new incentive was established late in FY 1977 to study and improve the influx to the U.S. of manufacturing technology advances and achievements of other nations which have shown growth in this area. This item will be more fully reported in FY 1978 when definitive results are available.

(U) Technology Development and Utilization in R&D Efforts. The OMT has urged SUBMACOM's to use and identify PEP as part of the development of the manufacturing technology process. As envisioned, this effort would cover not only producibility studies for specific end items but would also include the laboratory development of new

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processes, methods and materials to be used in development or manufacturing. This effort could be single end item oriented or generic. An example of single end item orientation would be in establishing the producibility of a developed product such as a helicopter composite rotor blade to be used on the AAH. An example of a generic application would be the computerization of an alloy materials handbook to allow optimum characteristics for a broad range of metal applications (armor, airframes, turbine blades, etc.).

(U) The technology of R&D efforts, conversely, deals with improvements in the R&D methods which are not presently dealt with in the AR's. An example of this is the use of interactive graphics in design - a part of the CAD, CAM, CIM, and group technology responsibilities of the OMT.

(U) Energy, Pollution and Safety in MM&T. The driving force behind the selection of MM&T projects has continued to be the identification of cost drivers and the means to reduce the cost and complexity of Army materiel manufacture. In addition to cost and lead-time reduction efforts, MM&T projects were initiated for the relief of critical material shortages and to assure safety of personnel working with hazardous materials. A major effort has also been undertaken to reduce energy consumption while at the same time controlling pollution.

(U) Pollution abatement is of concern to the Army due to the unique nature of air and water pollutants which may be emitted at Army Chemical and Munition Plants. Energy conservation is of particular concern since Army Ammunition Plants consume half of the entire DARCOM energy budget of about 30 giga joules.

Impacts on OMT Mission

(U) AMARC implementation has had a major impact in all previously described OMT programs. The reorganizations, splitting out of commands, and establishment of new General Operating Agencies (GOA) affected the management of on-going activities and programs. It doubled the number of points of contact, often with the assignment of new personnel who know little about VE, PEP, MMT, and PE. Continuity was therefore often difficult to maintain and new working relationships had to be established. This transition to new points of contact will require some further adjustment and understanding.

Product Improvement

(U) The September 1976 congressional limitation on product improvement and modification kit installation in the amount of \$44.077 million set a severe challenge to the successful accomplishment of

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the goal of eliminating the backlog of uninstalled kits. This limitation occurred at a point in time when prior year procurement of the kit hardware had progressed beyond cancellation or rescheduling. The kit hardware would be delivered, whether or not it could be installed, and obviously would increase the backlog of uninstalled kits.

(U) It was recognized that an appeal to the Congress was necessary, although it was further recognized that a formal reversal or modification of the congressional restriction would consume a significant part of the fiscal year. There would be no avoiding an adverse impact on the approved plan for the reduction of the kit backlog.

(U) Extraordinary effort on the part of representatives of DCSLOG, DCSOPS, and DCSRDA on behalf of the Department of the Army, and many elements of DARCOM headquarters and the subordinate commands, resulted in reorientation of the priorities and schedules for modification kit installation in order to optimize the use of the limited installation resources for the FY 1977 period. Subsequent fiscal year installation plans and programs were revised in consequence to minimize the disruption of the goal of unapplied/installed kit backlog.¹

(U) Negotiations through Department of the Army channels resulted in a meeting on 21 April 1977 between the Senate Appropriations Committee (SAC) staff member responsible for the congressional restriction and COL Gimple, Chief of the DARCOM Office of Product Improvement. COL Gimple explained the purpose of the FY 1977 product improvement and modification kit program with its emphasis on the reduction of the unapplied/installed kit backlog from prior years. The SAC staffer acknowledged that there had been a misunderstanding of the intended use of the application/installation dollars, the disruptive effect of the limitation in FY 1977, and indicated that the FY 1978 product improvement installation program would not be cut.² Although the offer was made to raise the restriction on modification kits with FY 1977 Program 7M, the acute shortage of OMA 7M in FY 1977 prevented acceptance of the offer.

(U) The concentration on modification funding did reveal a worthwhile opportunity to accomplish conversion or modification through the supplier of the kit hardware. In effect, the same procurement appropriation that provided for the acquisition of the improvement/modification kit hardware was appropriate in many instances for funding

¹Msg, DRCPI, 051656Z Oct 76, Subj: FY 77 Funding Restraints on PIP & Other Modification Kit Application Including Conversion.

²Memorandum, 22 Apr 77, Subj: Product Improvement Congressional Ceiling.

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the installation of the kits by the same contractor. Definitive guidance to this end was sought and Army Comptroller confirmation was given such usage on a case-by-case basis.³ As a direct result, \$4.5 million FY 1977 OMA Program 7M previously programmed for the conversion of M88 recovery vehicles to diesel power was made available for modification kit application and the M88 conversion accomplished with reprogrammed procurement funds.

(U) Subsequently, this Office strongly supported to DCSRDA the revision of AR 37-XX to permit procurement and kit application/installation from the same contractor using the procuring appropriation. With assurance that the regulation would indeed be so changed, DRCPI issued guidance to the field encouraging consideration on a cost effective basis of contractor procurement and installation of kits with the procurement appropriation.⁴

(U) Efforts initiated in January 1976 to seek relief from the 1972 congressional requirement that modification and kit application generally be restricted to OMA Program 7M for accomplishment was renewed by the DARCOM Commander on 12 April 1977.⁵ Additional justification was acknowledged by the Deputy Chief of Staff for Research, Development and Acquisition with reaffirmation of his support.⁶ The action passed into the hands of the Comptroller of the Army for Staffing.

(U) The installation of modification kits continued under intensive management and with high interest. An essential feature of the General Officer Product Improvement Review Board meetings in December 1976 and in June 1977 was the presentation of the status of modification kit backlog reduction and kit installation accomplishments by the Chief of the DARCOM Product Improvement Office. The successful management of the installation of modification kits as well as other aspects of the Product Improvement Program led to the GOPIRB's determination, on 11 July 1977, that the Board's continuance was no longer necessary.

³Msg. DAMO-WSW, 302026Z Dec 76, Subj: Funding of Vehicle Conversion Programs.

⁴Ltr, DRCPI, 7 Sep 77, Subj: Responsibilities of the PIP Proponent.

⁵Ltr, DRCPI, 12 Apr 77, Subj: Funding for Application of Product Improvement Kits.

⁶Ltr, DAMA-PPP-6, 1 Aug 77, Subj: Funding for Application of Product Improvement Kits.

⁷Ltr, DAMA-PPM-M, 11 Jul 77, Subj: Dissolution of the General Officer Product Improvement Review Board (GOPIRB).

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(U) The Joint DA/TRADOC/DARCOM Product Improvement Review, which had hertofore served as the reviewing and recommending body to the GOPIRB, now assumed the GOPIRB responsibilities. Results of the review determined the planning year product improvement program which was presented to the next Research Development and Acquisition Committee (RDAC) for final fiscal program approval. DARCOM acted as both host and secretariat for this Joint Review since its initial meeting in November 1976. This joint body consisted of Action Officer representatives from the Offices of the Deputy Chief of Staff for Logistics (DCSLOG), the Deputy Chief of Staff for Operations (DCSOPS), and the Deputy Chief of Staff for Research, Development and Acquisition (DCSRDA) for the Department of Army. The US Army Training and Doctrine Command (TRADOC) provided the representation for the user of the materiel, and the US Marine Corps provided informal representation, along with valuable recommendations based on first-hand experience with the equipment in the field. DARCOM major subordinate command representatives presented the briefings and responded to questions, and DARCOM Headquarters elements provided comments and recommendations. The consensus determinations were formally reported in the Joint Review minutes. These identified final approval/disapproval action, with the rationale for the latter, and the DCSOPS priority assigned for each approved PIP.

(U) It has been necessary to emphasize the product improvement responsibilities inherent in the management responsibility for a particular weapon system or line item of equipment. The item manager bears responsibility for it in its entirety--from its inception, coordination, approval, funding, prototyping and testing, procurement, fielding and installation through the determination of the user's satisfaction with the improvement. All of the foregoing plus training, logistical and functional impacts must be addressed in the Product Improvement Proposal and be updated as events dictate during the accomplishment of the improvement.

(U) With the reorganization of the DARCOM commodities commands into interfacing readiness and development commands, the matter of product improvement responsibility resulted in confusion and misunderstandings. To resolve this problem area, previous guidance (6 April 1976) was reiterated to all of the DARCOM commands by DRCPI message dated 28 June 1977. This message pointed out that the assigned management responsibility also carried the product improvement responsibility and that when the management responsibility transitioned from the Development between the Readiness Commands, the product improvement responsibility transitioned also.⁸ However, indications

⁸Msg, DRCPI, 281955Z May 77, Subj: Management Responsibility for Product Improvement Projects.

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of continuing difficulties between new Readiness and Development Commands led this Office to recommend that DRCPI revise the existing Letters of Instruction (LOI) to eliminate the contradictory portions causing the confusion. Recommended rephrasing was offered.⁹

(U) The DARCOM responsibility for product improvement had its counterpart in the responsibilities of TRADOC and the other Major Army Commands (MACOM) in representing the requirements and interests of the ultimate user of the equipment in the field. These MACOM responsibilities, primarily channeled through TRADOC, included the prompt and accurate reporting of problems with equipment, review of these reports with the DARCOM commodity commands to identify the problems that could most effectively be remedied through product improvement, support of appropriate priority assignments for these improvements, participation through product improvement planning of testing and installation, participation in joint reviews to determine the suitability of the improvement for procurement, fielding, and development of detailed kit installation and conversion schedules. Participation in disciplined system reviews was a primary source of product improvements. To promote understanding and encourage participation, the Product Improvement Office initiated a continuing series of product improvement orientations at TRADOC Headquarters and its schools. These orientations, especially at Action Officer level, were received eagerly. It was too early to see the expected increase in participation by the user and his representatives in the various joint materiel reviews.

(U) Somewhat similar in objectives and content, orientation seminars on product improvement policy, procedures, and programs were conducted by DRCPI for the major subordinate commands of DARCOM. During FY 1977, seminars were held at almost all of the major subordinate commands. It was planned to continue these orientations on a periodic basis as both new command organizations and policies evolved.¹⁰

(U) Policy evolution was reflected in the dedicated effort in the latter part of FY 1977 to review the 1975 product improvement regulation AR 70-15 which no longer served accurately the concepts and coverage of product improvement. In June 1977, DRCPI requested that the proponenty for the revision of this regulation be delegated to DARCOM,¹¹ and DAMA-PPM complied on 13 July 1977.¹² The revisions

⁹DF, DRCPI, 21 Sep 77, Subj: Management Responsibility for Product Improvement Projects.

¹⁰DF & ltr, DRCPI, 23, 26 Sep 77, Subj: Product Improvement Orientation.

¹¹Ltr, DRCPI, 30 Jun 77, Subj: Product Improvement Regulation Proponenty.

¹²1st Ind, DAMA-PPM-M, 13 Jul 77, Subj: Product Improvement Regulation Proponenty.

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to AR 70-15 will include the integration of AR 750-10, Modification of Materiel. This latter regulation provided the guidance for the preparation and issuance of Department of Army Modification Work Orders (DAMWO). The Department of Army Inspector General (IG) recommended in November 1976 this consolidation to avoid administrative redundancy and recognize that effective 1 October 1976 no modification to fielded equipment would be accomplished except as the result of an approved product improvement proposal. For those relatively few DAMWO's approved but incomplete prior to 1 October 1977, Product Improvement Proposal identification numbers were issued to permit auditing and accomplishment of the modifications. The draft of the revised AR 70-15 was scheduled for coordination throughout the Army in early FY 1978.

(U) The Product Improvement Program grew from \$627 million in FY 1977 to \$810 million in FY 1978, and the FY 1979 program approved in July 1977 was estimated at \$983 million.¹³ These totals included all funding appropriations impact in the identified fiscal years. Since a single product improvement proposal (PIP) required funding from at least two appropriations (RDTE, Procurement, OMA, or Stock Fund), and a balanced sequential programming and budgeting effort for each of over 700 ongoing approved PIP's, each of which was subject to changes for various reasons, an enormous management challenge resulted. To provide a viable and readily available data source for this management information, DRCPI created a product improvement data base. The performance of this data base fully justified its establishment. Its flexibility in providing funding stratifications in response to information requirements has been outstanding, although its full potential is yet to be realized.

(U) During FY 1977, in participation with the DARCOM Office of the Comptroller, a series of performance indicators for product improvement was developed and the initial report presented in August 1977 to the DARCOM Commander. The performance indicators address program growth, fiscal obligations, kit installation status (including backlog reduction), and selected PIP milestone accomplishments by the major subordinate commands. These presentations to the DARCOM Commander were scheduled quarterly. The information source for the data was contained in the Product Improvement Management Information Reports (PRIMIR) required on a quarterly basis for all active PIP's. Its format was developed by DRCPI based upon management information requirements and was being upgraded in the revision of AR 70-15 for better information display, funding stratification, and performance indicators. The same two-page format was used for product improvement approval, coordination, and reporting.

¹³Chart - Product Improvement Program Growth.

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(U) Specifically delineated in the draft revision of AR 70-15 was the requirement for the independent evaluation of test data by either the Test and Evaluation Command or the Army Materiel Systems Analysis Agency (AMSAA). This analysis, to be accomplished and considered prior to any production decision, was required for all PIP's. Pending publication of the new regulation, guidance was provided by DRCPI letter dated 2 September 1977 and signed by the Deputy Commanding General for Materiel Development.¹⁴

(U) Another point indicative of the increasing scope of product improvement and requiring revision of the current regulation was the 31 May 1977 directive from the Deputy Chief of Staff for Research, Development, and Acquisition in respect to reducing the life cycle costs.¹⁵ This action authorized value engineering proposals relating to deployed materiel to be included in the Army Product Improvement Program.

(U) The DAIG manpower survey team mentioned earlier recommended that the Configuration Management responsibility currently vested in DRCPI be transferred to the Research and Development Directorate (DRCDE) along with the TDA space. DRCPI concurred but recommended that the GS-12 Equipment Specialist and his space on the DRCPI TDA be transferred to DRCDE along with the Configuration Management (CM) function. The incumbent, according to his job description, is assigned the CM role.

Laboratory and Development Command Management

(U) During FY 1977 the Office of Laboratory and Development Command Management (DRCLDC) recommended to the Assistant Deputy for Science and Technology and DRCDMD the annual ranking of the DARCOM laboratories based on individual evaluations. Then following the procedure outlined in AR 672-305, certain nominations were made to the Assistant Secretary of the Army (Research and Development). Ballistics Research Laboratories was nominated for Army Laboratory of the year which was accepted by the Department of the Army and awarded by the Assistant Secretary of the Army (R&D). Also, the Combat Surveillance and Target Acquisition Laboratory, the Night Vision Laboratory, the Ballistics Research Laboratories, the Missile RD&E Laboratories, and the Human Engineering Laboratory were given awards for

¹⁴Ltr, DRCPI, 2 Sep 77, Subj: Product Improvement Testing.

¹⁵Ltr, DAMA-PPM-M, 31 May 77, Subj: Product Improvement Proposals (PIP) to Reduce Life Cycle Costs.

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Excellence. The Combat Surveillance and Target Acquisition Laboratory was nominated for a Special Award for showing the most improvement.

(U) To develop the FY 1978 program allocations and the FY 1979 budget submissions, this office held from May to July 1977 DA-DARCOM combined RDT&E program reviews at all major field installations to develop the FY 1978 program allocations and the FY 1979 budget submissions. Participants included DRCDE, DRCBSI, AMSAA, TRADOC, and DCSRDA; but not the Office of the Director, Defense Research and Engineering.

(U) This office organized two conferences of the DARCOM Laboratory Directors and invited appropriate HQ DARCOM and DA staff and commanders to attend. The first was hosted on 28-29 October 1976 by MERADCOM at Fort Belvoir; and the other was hosted by ECOM on 26-27 April 1977 at Red Bank, New Jersey. At the Fort Belvoir conference, the Deputy CG for Materiel Development and his staff for minor programs, manufacturing technology, product improvement, and project management gave a picture of those activities which impinged on Laboratory directors. Personnel matters dominated the discussions at the New Jersey conference. They ranged from average grade and high grade roll backs to manpower beyond planned glide path.

(U) Other typical actions by the office included the following: conducting the Project Manager Orientation briefing on the DARCOM Technology Base and Laboratory Operations; directing memoranda of agreements on fuze management and fire control; and staffing and having published for distribution a revised AR 70-5 on Grants to Nonprofit Organizations for Support of Scientific Research based on the new OMB Circular A-110 which increased the financial reports required of grantees.

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CHAPTER VIII

PROJECT MANAGEMENT: WEAPONS

Concept¹

(U) The concept of Program/Project/Product Management was a flexible, highly responsive form of intensive management which held each Project Manager responsible and accountable for the successful accomplishment of his chartered mission. Those missions which were appropriate for selection for program/project/product management included materiel development and acquisition, fielding and materiel readiness of systems, a combination of these, or general business management of non-system/item oriented programs.

(U) This DARCOM concept of project management provided for a variety of project manager organizations designated to meet specific mission requirements while effectively employing scarce resources. It permitted the establishment of project managers who were appropriately identified as being program, project, product, single or multi-system, single or multi-level, single or multi-service, single or multi-command, materiel development or materiel readiness, general business management, life-cycle or indefinite duration, or a combination of these.

(U) Project managers reported to and were subordinate to the commander of the command (DARCOM or sub-MACOM) to which they were assigned. PM's who were assigned to a sub-MACOM would normally be collocated with that command.

(U) Only DARCOM officials with the authority to speak for the respective Commanding Generals could issue directives to PM's, and only within their assigned areas of responsibility. In issuing such directives, the issuing authority was accountable for their impact on the affected PM-managed programs.

(U) Under normal circumstances the Project Manager utilized the services of the procuring official of the command or other procuring agencies. Sub-MACOM commanders were responsible to insure that contracting officers were completely responsive to the procurement requirements placed by Project Managers and that PM decisions and instructions were translated into appropriate contract provisions.

¹DARCOM Regulation No. 11-16 Army Programs, PROGRAM/PROJECT/PRODUCT MANAGEMENT, dated 11 August 1977.

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(U) Narrated below are the FY 1977 activities and accomplishments of six project and program managers for weapons who reported directly to the DARCOM Commander at Headquarters DARCOM. The systems covered in Chapter VIII pertaining to weapons include PM-Fighting Vehicle Systems, PM-XM-1 Tank System, PM-Black Hawk-Utility Tactical Transport Aircraft System (UTTAS), PM-Advanced Attack Helicopter, PM-Smoke/Obscurants, and PM-Nuclear Munitions. PM-PATRIOT and PM-ROLAND are covered in the FY 1977 Annual Historical Review of the US Army Missile Materiel Readiness Command (MIRCOM). Chapter IX includes the FY 1977 accomplishments of equipment systems project manager offices reporting directly to the DARCOM Commander.

Fighting Vehicle Systems (FVS)

Background

(U) The Office of the Project Manager, Mechanized Infantry Combat Vehicle, was established in January 1968, and reported directly to the Commanding General, US Army Materiel Development and Readiness Command (DARCOM). It was reorganized and redesignated in July 1975² as the Office of the Project Manager, Mechanized Infantry Combat Vehicle Systems, and at the close of FY 1977 was located at 28150 Dequindre, Warren, Michigan 48090. Brigadier General Stan R. Sheridan was designated the Department of the Army Project Manager for the Mechanized Infantry Combat Vehicle Systems (MICVS) effective 14 July 1975.³ In May 1977, DA approved the change in above titles to Program Manager, Fighting Vehicle Systems (PM-FVS).

(U) The current Project Manager Charter was approved by the Honorable Norman R. Augustine, Under Secretary of the Army on 25 March 1976.⁴ The Project Manager was delegated full line authority of the Commanding General, DARCOM, for centralized management of the MICVS project. Necessary facilities and support continued to be provided by US Army Tank-Automotive Materiel Readiness Command (TARCOM), other organizations with DARCOM, and other participating organizations. A revised MICVS Charter was submitted to DARCOM/DA for approval reflecting the redesignation of Project and Assistant Project Manager to Program and Project Managers.

²DARCOM General Order No. 56, 19 Apr 76.

³Special Orders No. 157, 6 Jun 75.

⁴Project Manager Charter, Mechanized Infantry Combat Vehicle Systems, Secretary of the Army, 25 Mar 76.

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Mission

(U) In accordance with Department of Defense (DOD) Directives 5000.1 and 4100.35; AR 1000-1, 700-127, and 70-17; DARCOM-R 70-1 and 11-16, the Program manager was responsible for program management of the FVS including the Infantry Fighting Vehicle (IFV), the Cavalry Fighting Vehicle (CFV), and other derivative vehicles. He managed the overall FVS program which will provide the Army with lightly armored full tracked fighting vehicles with two variants - an infantry version and a cavalry version. These vehicles will have improved cross-country mobility, mounted firepower, a swim capability and be air transportable, with communication and protection for the infantry and cavalry squad in mounted combat. He was directly responsible for life cycle management of the FVS and will centrally coordinate, integrate, and support the materiel development and acquisition activities of the subordinate PM for Fighting Vehicle Armament (FVA) Systems, who was responsible for the XM714 Fuze Series for all applications, the FVS firing port weapon, and the Vehicle Rapid Fire Weapon Systems.

Personnel Organization

(U) At the end of FY 1975, the authorized strength for the MICV Office was 10 Military and 50 Civilians. Authorization for FVS stood at 26 Military and 108 Civilians. This increase was a direct result of the significant increase in mission and scope of the former MICV Office.

Significant Events

(U) MICV 20MM. The award of a MICV (with 20mm Cannon) development contract to FMC Corporation occurred in November 1972. About 13 months later, contractor tests started on the MICV, and almost immediately problems occurred in the areas of the suspension and transmission. In July 1975, a back-up transmission program with Allison was initiated, as well as a reliability improvement program with General Electric Company. Government testing began in October 1975 with the 20mm MICV.

(U) In February 1976, after reviewing the first 18,568 miles of Government tests, it was decided to stop the tests and call up the Allison transmission as well as to make major modifications to the vehicle configuration to correct 20mm feed system and suspension problems. Government testing resumed in October 1976 and was terminated again in February 1977 with the proposed termination of the 20mm MICV Program.

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(U) Vehicle Rapid Fire Weapon System (VRFWS). During early MICV development the need surfaced for an improved main gun, known as the Vehicle Rapid Fire Weapon System (VRFWS). A competitive prototype evaluation was conducted and concluded in December 1973. However, the winner was not announced pending reevaluation of the need by TRADOC. In July 1974, based on Cost and Operational Effectiveness Analysis (COEA), the need was confirmed. In December 1974, an Army Systems Acquisition Review Council (ASARC) recommended the initiation of engineering development of a 25mm self-powered automatic gun developed by Aeronutronic Ford Corporation. This weapon fired the Swiss Oerlikon 25mm Family of ammunition.

(U) A Defense Systems Acquisition Review Council (DSARC) was held in March 1975 to review the ASARC recommendation. The decision of the DSARC significantly restructured the Army's program as follows: (1) Approved the selection of the 25mm caliber weapon and ammunition; (2) Directed that the Swiss Oerlikon 25mm automatic gun KBA-B02 be evaluated and used as a baseline for any further self-powered gun development; (3) Directed that the Swiss Oerlikon 25mm family of ammunition be Americanized for production; and (4) Directed that the Army expeditiously initiated development of a 25mm externally-powered automatic gun for comparative evaluation with the self-powered automatic gun.

(U) The DSARC direction to use the KBA-B02 as a baseline had merit due to the fact that the Aeronutronic Ford Gun was very similar to the KBA-B02. Both weapons descended from the same basic design but the KBA-B02 was further along and had entered low rate production. The decision to also evaluate an externally-powered 25mm gun was based on the potential of that type weapon to significantly improve reliability. In July 1975 Aeronutronic Ford was awarded a contract for ammunition Americanization and for the 25mm self-powered (SP) gun. However, the gun effort could not commence until the KBA-B02 had been baselined and necessary improvements identified. This took considerable time and it was not until February 1976 that the production engineering and improvement of the SP 25mm gun (XM241) began. In the meantime the Army evaluated proposals for an externally-powered (EP) 25mm gun and in February 1976 awarded a contract to Hughes Helicopters for development of the XM242.

(U) 25MM Weapon Station. Concurrent with the development of the 20mm MICV, FVS was developing a second weapon station that would incorporate the 25mm gun in a one-man turret. This weapon station was planned to be incorporated into the MICV in the second year of production.

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(U) IFV/CFV (Formerly M CV TBAT II). In July 1976, the Secretary of the Army challenged the concept of, and requirement for, the Mechanized Infantry Combat Vehicle. The basis of the challenge was the fact that FVS would be fielding a weapon system that would be incapable of engaging the perceived threat which would include massed tanks on the battlefield.

(U) Therefore, in August 1976, a special Task Force was appointed by DA to make an independent examination of the MICV, XM-723, to determine if the vehicle being developed would meet the Army's future needs in view of the postulated threat. The Task Force was headed by BG Richard Larkin, then an ADC in the 4th Infantry Division.

(U) The following Task Force recommendations, presented to DA in October 1976, were approved by the Secretary of the Army on 3 November 1976: a common vehicle will be developed for both the infantry and scout roles; the vehicle will be equipped with a 25mm automatic cannon, a coaxial machine gun, and TOW missiles; the TOW launcher will have two tubes and be non-elevated (an elevated launcher to permit firing from a full defilade position was considered as well as a four tube launcher - both were rejected); firing ports will be retained on the infantry vehicle; the vehicle will swim (a barrier arrangement may be used); the vehicle armor protection levels should remain unchanged from the original MICV requirement; basis of issue for the infantry vehicle will be four per platoon, 13 per company and 41 per battalion.

(U) Based on this decision, a contract was awarded on 12 November 1976 to FMC for full scale development of a common fighting vehicle, except for interior configuration, for both infantry and cavalry use. Initial production vehicles were scheduled for delivery starting in May 1981.

(U) In January 1977 an OSD Program Budget Decision eliminated the one-man station 20mm MICV from FY 1978 procurement and authorized only 27 20mm MICV's in FY 1979. It became clear that those 27 unique vehicles would have been a severe burden on the Army and a waste of resources. Therefore, it was recommended to the Vice Chief of Staff, and he approved on 29 March 1977, that the 20mm MICV program be terminated and all resources be applied to bringing in the new Infantry-Cavalry Fighting Vehicle.

(U) Recent Program Direction/Milestones. Several significant Things occurred in the FVS program since early April 1977 and are briefly in chronological order. In April 1977, authorization was provided by DA to proceed with the development of a Derivative Vehicle to be used as the Carrier for the General Support Rocket System (GSRs).

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LTC James B. Welsh was appointed Assistant Project Manager for the Derivative Vehicles. A contract with FMC for seven prototype GSRS Carriers was signed on 3 June 1977. Six of these prototypes were to be provided to the Project Manager-GSRS for total GSRS system testing (Government and user) which was to begin in May 1979.

(U) A Source Selection Evaluation Board met in May 1977 to recommend selection of a single transmission from the two competing IFV/CFV candidates, Allison and General Electric. The G.E. transmission was selected and the decision announced on 1 June 1977. The contract was awarded on 3 June 1977 to G.E. to provide transmissions for the IFV/CFV development program as well as the GSRS Carrier program. Design improvement and interface changes to the G.E. transmission were underway, and it was anticipated that the schedule and performance requirements will be met.

(U) A "Phase II" IFV/CFV contract was awarded 30 August 1977 to FMC to develop, build, and test eight engineering development fighting vehicles and one automotive test rig. These vehicles will be used for Government and user testing leading to the ASARC/DSARC production decision scheduled for November and December 1979.

Logistics Management

(U) Logistic Support. Data prepared during the engineering design (ED) phase was being updated and re-input to the MICV System Logistic Support Analysis Record (LSAR) ADP System at FMC. A modification to the LSA H worksheet and the LSA-35 ADP summary was enabling the MICV Systems PM to be the first to provision utilizing LSAR data.

(U) PMAC Review. A major effort took place at FMC, San Jose, California, from 30 November 1976 through 17 December 1976. This was the review of the Preliminary Maintenance Allocation Chart (PMAC). It involved members of the MICV's PMO, TARCOM, ARRCOM, and FMC personnel.

(U) FMC prepared an excellent PMAC. Although changes were necessary, they were merely coding changes and considered relatively minor. There were no major revisions required.

(U) The PMAC was accepted by the government with the qualification that discrepancies noted during the review would be corrected. Upon receipt of the revised PMAC, it will be examined to assure that all such problem areas have been corrected.

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(U) Operator Manual Revision. In keeping with project LEAP regarding minimal operator checks; MIL-M-63036, which called for log book size operator manuals; and FORSCOM Regulation 750-4, FORSCOM reduced Maintenance Program, which provided preparation guides, a major effort was initiated to change the MICV's operator manuals to the above specifications. All operator tasks were to be listed sequentially. This approach was agreed to by the user, representatives of Fort Benning.

(U) A major review of the manuals were held 29 November 1976 through 3 December 1976. As a result of this review, many problems were resolved and the program was progressing well. The MICV's will thus have fully updated manuals in the latest configuration.

(U) OT IIa. Operational test (OT) IIa was established to reevaluate the test firing of the 20mm gun because of many problems encountered during OT II.

(U) CADRE training started 1 February and concluded 22 February 1977. CADRE/Player training started 23 February and concluded 4 March 1977. The training and subsequent firing of the gun proved highly successful.

(U) OT IIa was cancelled on 2 April 1977 due to the elimination of the 20mm MICV program. All OT II/PQT-G effects were stopped during this period, and vehicles were returned to the contractor for future modification and overhaul to conform with the two-man turret requirement which mounted a 25mm cannon and a TOW Missile System.

(U) Development Plan. This office updated Sections V and VI of the Development Plan to reflect the TBAT configuration. The update, modified to meet DARCOM Supplement 1 to AR 700-127 standards, was sent to the ILS office at TARCOM and TARADCOM for review.

(U) ITDT/Training Devices. A joint working group met on 17 January 1977 in Orlando, Florida to review the provisions of AR 1000-2. This group was hosted by PM-MICV and PM-TRADE and included representatives from TRADOC, Logistic Center, USATSC, PM-TOW, and Infantry School at Fort Benning.

(U) Discussions revolved around the AR and how the Integrated Technical Documentation and Training (ITDT) concept could be adapted so that applicable training devices and publications would be available to support the MICV/TBAT II OT II test.

(U) Vehicle Swim Test. Troops from Fort Ord were trained during the week of 20 June 1977 at FMC Corporation for the conduct of a swim test which was successfully completed employing the modified flotation curtain at vehicle weight of 45,000 pounds.

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(U) Design Evaluation Reports. A review of outstanding Design Evaluation (DE) reports was conducted at FMC during the week of 20 June 1977. During this review, all outstanding DE's resulting from the last three maintenance evaluations were resolved and all reports were finalized and completed. A total of 226 reports were generated during these evaluations of which 105 were incorporated, either during the build-up and assembly of ED vehicles, through modification kits, and/or during vehicle retrofit. Sixty-nine were to be incorporated into Phase II of the IFV/CFV Program. The remainder of reports were deleted as not pertinent to Phase II.

(U) Transmission Maintenance Evaluation. A maintenance evaluation of the GE and Allison transmissions was performed at APG 2 through 13 May 1977. Actual mechanical work was performed by an assigned MOS63H (Automotive Powertrain Repairman) and a DAC mechanic from the Powertrain Shop. All procedures allocated to the DS/GS maintenance level were performed. As a result of the maintenance evaluation, some instructions in the TM's are being updated to achieve clarification, ease of maintenance, incorporation of improvements from RISE configuration for GE, and the latest design improvement for Allison. Participation in the maintenance evaluation included representatives from FVS, PMO, TARCOM, TARADCOM, USAOCCS, MTO-APG, GE and Allison. Representatives from the transmission SSEB were also in attendance.

(U) Phase I Contract. A contract modification was initiated for Phase I which required the contractor to commence work toward the development of Integrated Technical Documentation and Training (ITDT).

(U) LSA/LSAR. "Version 8" of LSAR ADP System pertaining to contractor developed provisioning technical documentation according to MIL-STD 1552 and 1561 was put "on line" at the contractor.

(U) FVS-PMO recommendations and guidance on the Provisioning Budget Forecast Procedure (PBFP) were endorsed by HQ DARCOM and were to be a direct output of the LSAR ADP program. PBFP will be incorporated into the LSAR library of programs and other PMO's will be able to estimate annual provisioning budget requirements without duplicate analysis and time consuming computations.

(U) Publications. A start of work meeting on IFV/CFV publications was conducted at FMS. Primary objective was to assure a common government/contract understanding of the related scope of work and data items pertaining to ITDT. As a result, the contract was modified to reflect agreement. Modification to the GSRS contract was initiated to provide an ITDT operators manual.

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Product Assurance Test and Evaluation

(U) Testing. Four vehicles which had undergone IROAN/retrofit during the last reporting period entered Phase II of PQT-G on 1 October 1976. The vehicles had received major modifications to the drivers/commander station, weapon station and night vision capability. These were primarily design changes requested by the user as a result of previous testing. Also, the Allison transmission was incorporated in two of the four vehicles to allow a competitive run-off with the GE transmission. Testing proceeded on schedule through 30 March 1977 when the VCSA terminated the MICV/20mm program. A total of 10,484 PQT-G test miles and 17,000 20mm rounds was accumulated during this test.

(U) Subsequent to 30 March 1977, testing continued at APG to accrue durability mileage to support the selection of one of two competing transmissions on 1 June 1977. Following the transmission durability test, APG conducted engineering design tests to compile basic data on the suspension system, smoke generation and speech intelligibility.

(U) Operational Test II (OT II). OT II was started on schedule 1 October 1976 at Fort Benning, Georgia. Field exercises proceeded on an expedited basis with the 197th Infantry Brigade. Several friendly/aggressor force tactics were employed using a MICV platoon and an M-113A1 platoon for comparison. As with the PQT-G vehicles, the four MICV's on test were also split out between the Allison and GE transmission.

(U) The four vehicles had accumulated 7900 miles and 11,000 rounds fired from the primary weapon when the test was terminated on 31 January 1977. Major problems experienced during OT II were a series of track throws and a failure to the ramp door latch.

(U) Due to a seeming lack of user training on the weapon station and 20mm armament, an OT IIa was scheduled for 4 April 1977 through 15 May 1977, but this test was cancelled when the MICV/20mm program was terminated. This test was to have consisted of a new platoon conducting firing exercises on Turrentine Range at Fort Benning.

(U) Prototype Qualification Test - Contractor (PQT-C) Demo. Prototype Qualification Test - Contractor (PQT-C) was initiated on 21 June 1977 at the contractors facility on the XM241 25mm gun with an initial inspection. The initial inspection of the hardware was performed to compare parts/components with drawing requirements, noting all deviations thereto. Firing was initiated in early July 1977 and continued through this reporting period.

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(U) Engineering Design Test Contractor (EDT-C). Phase I development of the IFV/CFV was initiated during this reporting period. Preliminary bench testing was underway and a TOW Tracking Test was initiated in early December 1976. The purpose of the test was to determine the accuracy of TOW tracking when using competitive drive systems mounted in the MICV. Firing tests on the XM-241 and XM-242 25mm guns proceeded on schedule at the Camp Roberts range.

(U) Quality Assurance. Quality Assurance program plans from all of the prime contractors and Product Assurance Plans from TARADCOM were submitted to this office and reviewed in the period of January-September 1977.

(U) During the second quarter of FY 1977 a concerted effort was made to accommodate the armament requirements of early ammunition and fuze deliveries, and acquiring ARADCOM commodity command support. Early acceptance and qualification testing at contractors facilities was accomplished by use of development specifications. This office was actively involved in monitoring contractor tests and reviewing waivers to contractor developed specifications.

(U) In August 1977, an implementing PMO regulation was developed and issued for Release of Materiel for Issue (DARCOM Reg 700-34) responsibilities. This document will be used to release approximately 10 PMO managed new items to the field in the 1981-82 timeframe.

(U) A West Coast field office was established in October with a quality engineer assigned for the purpose of providing quick reaction to the contractors and to reduce travel expenses. The two representatives assigned (one from quality and one from RAM) will report to the PAT&E Division Chief thru the West Coast FVS Liaison Officer.

(U) RAM-D. The MICV/20mm demonstrated a reliability of 265 mean miles between failure upon termination of PQT-G/OTII. This result represented all data as officially scored by the MICV scoring conferences which were held throughout the test. The reliability achievement was above the Project Manager's prediction of 225 mean miles between failure which was demonstrated during the Phase I PQT-G. The improvement was a result of the intensively managed reliability program conducted between Phase I and Phase II of PQT-G.

General Support Rocket System

(U) The General Support Rocket System (GSRS) was being developed to provide a low cost, multiple launch, unguided rocket system. It was to be a quick reaction, non-nuclear system and was intended to

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supplement existing field artillery. As such, it was to operate within the division areas and provide the capability to engage mid-range targets, deliver large volumes of fire, and defeat lightly armored targets. To improve the survivability of the GSRS, it combined the use of armor protection, quick reaction and "shoot-and-scoot" tactics.

(U) The General Support Rocket System was being developed under the direction of the Project Manager, GSRS located at Redstone Arsenal, Alabama. A TRADOC Systems Manager has been established and is located at Fort Sill, Oklahoma. As a derivative of the Infantry Fighting Vehicle, the GSRS Carrier was being accomplished via a support agreement with the Program Manager, Fighting Vehicle Systems.

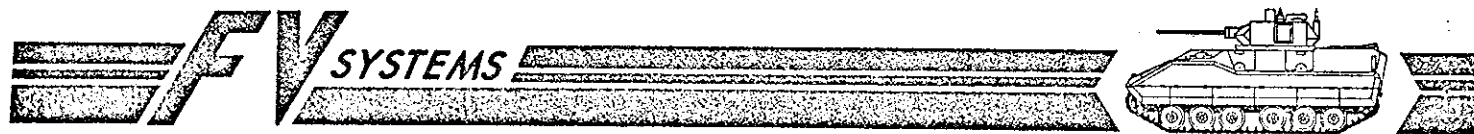
(U) The vehicle was a "cab-over-transmission" configuration providing space for the three-man crew with necessary fire control equipment. Sufficient armor was provided to permit the completion of a fire mission without dismounting from the vehicle. The launcher, rockets and associated fire control equipment were being developed separately from the vehicle.

Assistant Project Manager, IFV and CFV Development

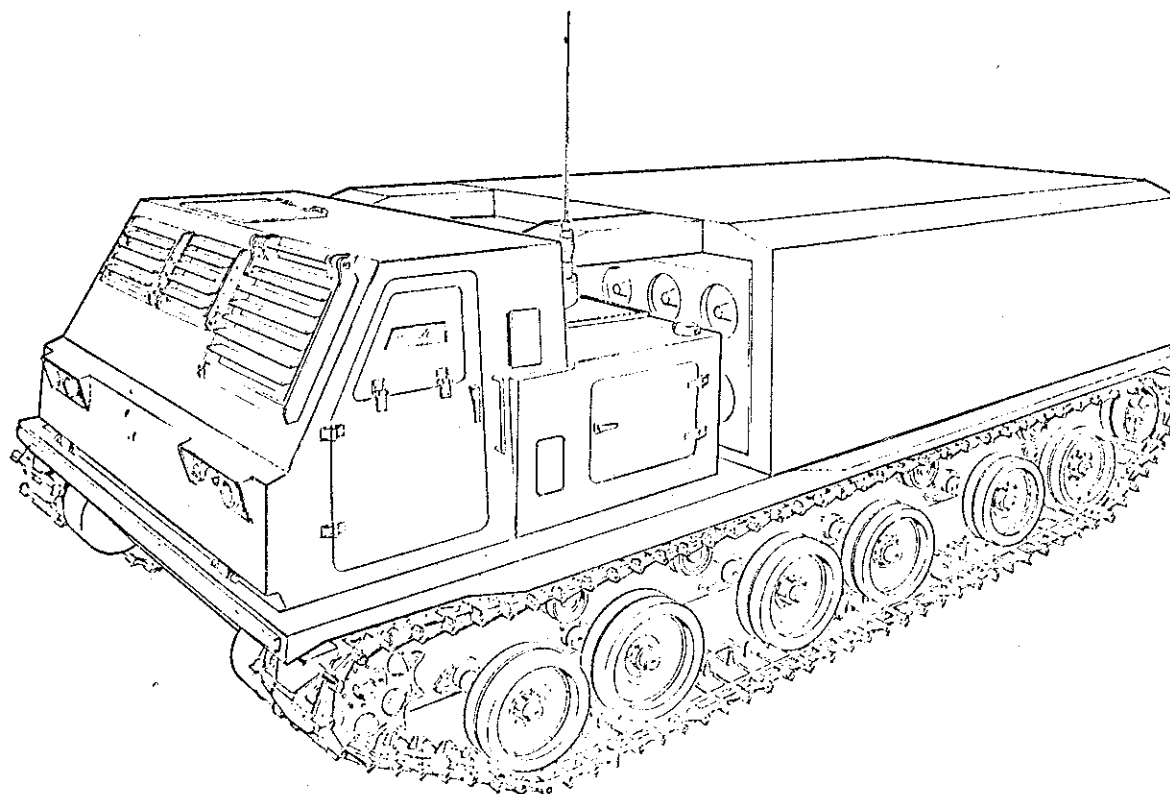
(U) The Mechanized Infantry Combat Vehicle Task Force (MTF), which was established by Department of Army on 4 August 1976, submitted their final report on 8 October 1976. The purpose of their MTF was to conduct a special, one-time review of the MICVS Program and related problems, and to study and make recommendations on issues evolving from the development of the MICV and MICV/Scout Systems. Their summary recommendations were that: a common vehicle for MICV be developed for the Infantry and Scout roles; development of the MICV include an integrated TOW missile capability for every combat vehicle the MICV turret be developed with a 2-tube, non-elevated TOW launcher system; the final MICV configuration have a 2-man turret mounting the TOW and 25mm Gun; the firing port weapon (FPW) be the integral supplementary armament for MICV; the stretched M113A1 not be considered as a combat vehicle; and the mechanized infantry battalion be equipped with four MICV's per platoon, 13 per company and 41 per battalion; all with the 2-man, TOW/25mm Gun turret.

(U) In October 1976, the results of the Task Force effort were briefed to the Vice Chief of Staff, Army, the Under-Secretary of the Army, and the Chief of Staff, Army. The Secretary of the Army was then briefed in early November 1976. Approval was subsequently granted to enter into a sole-source letter contract with FMC Corporation for the development of the MICV 2-man turret system. Emphasis was placed on the anticipated large cost savings which could be realized from maximizing the commonality of the Infantry and Scout configurations in this development.

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GSRS Transport Vehicle



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(U) The new development effort was structured to be accomplished in two phases. Phase I was primarily concerned with the development of the 2-man turret mounting the TOW and 25mm gun systems, as well as the redesign of the hull in those areas affected by the 2-man turret and new personnel requirements. Phase II would be implemented the following fiscal year and would complete the development of the total system. A letter contract with FMC Corporation was formalized for Phase I on 3 November 1976, and several in-depth meetings were held during that month to redefine the requirements of the contract. A mini-task force was established to provide guidance for the concept design approach. In addition, representatives of the Infantry and Armor community met in December 1976 and January 1977 with the Project Manager to review the development progress and provide User guidance.

(U) MICV and Scout COEA Study Advisory Group (SAG) Meetings were held in mid-October 1976 at TRADOC Headquarters. Subsequently, a MICV/Scout COEA SAG Meeting was held at Fort Knox on 30 November 1976. It was decided that the MICV and Scout COEA SAG's would be combined, having a single SAG chairman. The COEA document was to consist of a joint executive summary with separate annexes for the MICV and Scout portions.

(U) Partial termination of the MICV/Scout Test Bed contract was initiated in December 1976 to effect cost savings. The terminated portion generally consisted in elimination of the test bed evaluations scheduled to take place at Fort Knox. Included also were the activities necessary to support the testing including training and technical representation.

(U) A briefing was presented on 9 March 1977 by the Project Manager, MICV Systems, to Mr. Miller, ASA (R&D) and LTG Cooksey, DCSRDA. At this meeting the following recommendations were made: the MICV development program with the 2-man turret should not be accelerated beyond the current schedule; the MICV 20mm program should be eliminated prior to April 1977; all Government and contractor MICV resources and assets should be redirected toward the development of the MICV with the 2-man turret; the MICV and Scout programs should be combined so that concurrent testing can be accomplished; and procurement of Long Lead Items in Fiscal Year 1979 should be authorized.

(U) An engineering mock-up review of the MICV with 2-man turret was held on 14 and 15 March 1977. Representatives of Fort Benning, Fort Knox, and Headquarters TRADOC participated in the review. Other organizations in attendance were AMSAA, OTEA, HEL, TRASANS, DA, HQ DARCOM, and PM TOW. A general officer review was then held on 16 March 1977 which included the Infantry and Armor Center CG's. Approval was given to the basic design which permitted the start of the detailed engineering and fabrication phase of development.

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(U) A second briefing was made by the PM, MICVS to the Vice Chief of Staff on 30 March 1977 which presented the same recommendations as the 9 March 1977 briefing. These recommendations were subsequently approved. As a result, further MICV/20mm OT II testing was terminated and efforts to redirect the program consistent with the new guidelines were initiated.

(U) In implementation of the DA decision to terminate the MICV 20mm program and redirect the total activity toward the new development, DA directed that the current MICV 20mm program assets and funding be utilized in furtherance of the new program objectives. A partial termination notice was issued for both the Engineering Development (ED) and Producibility Engineering Planning (PEP) phases of the MICV 20mm contract, although work was continued on the chassis that was common to the MICV/2-man turret program.

(U) To further consolidate the program activities, it was determined that the MICV ED program would be continued for activities related to the MICV/2-man turret development such as correction-of-deficiencies, design improvements, weight reduction and cost reduction, but this contract would be phased out as early as practicable. Further, the Phase I contract would be continued as it was, and the introduction of the Phase II contract would be accelerated to initiate necessary new vehicle development and for the ordering of Long Lead Items.

(U) An Infantry System Program Review (ISPR) was held on 11 May 1977 at Fort Benning in which the FVS Office participated. Two MICV vehicles were used for demonstration of both stationary and on-the-move firing. One of the two MICV vehicles used in the ISPR was subsequently sent to Fort Knox for a period of six weeks to evaluate its intended use in the Scout role. It participated in operational testing as well as maintenance evaluation.

(U) A joint work group was established to address commonality of componentry between the XM1 and FVS. The results of this effort were briefed on 9 June 1977 to the Army and Infantry Schools at Fort Knox. At the conclusion of the briefing, MG McEnery directed that a letter be sent to General DePuy stating that an examination of commonality had been made, and that commonality existed in the areas of sight reticles and control handles. Also, that there was potential for commonality in training devices which the PM TRADE was coordinating.

(U) It was determined early in July 1977 that the IFV/CFV development contractor had underestimated both the level of effort and costs required in Phase II to accomplish the necessary activities. As a result, extensive discussions were conducted with the contractor to

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realign the scope of work consistent with the program constraints. Since the resultant changes affected testing to a large degree, TECOM, OTEA and the TRADOC Systems Manager (TSM) for FVS were briefed on the new program in early August. The briefings were well received and general concurrence was obtained. A deskside briefing was also held with the CG USAIC who gave support to the program. Subsequently, DARCOM and DA were notified of the program changes.

(U) A joint meeting was held in mid-July 1977 between the PMO FVS, the Infantry School and the Armor School to discuss the materiel need (MN) for the IFV and the CFV Annex. A coordinated, agreed-on document was concluded and forwarded to HQ TRADOC who disagreed with the reliability portion. Additional meetings have been subsequently held but the problem has not yet been resolved.

(U) The results of the IFV/CFV COEA were presented to General Starry, CG TRADOC, on 13 July 1977. He did not approve the forwarding of this document to DA in its current form. Rework of the COEA was initiated, and submission of the document to DA was scheduled for early January 1978. DA requested, through DARCOM in late July 1977, the revision of the FVS DCP Cover Sheet. The revision was to include the current program for the IFV, the CFV, the Firing Port Weapon (FPW), Training Devices and the 25mm Automatic Gun and Ammunition. Development of the cover sheet was initiated and a submission of the document to DARCOM was scheduled for early October 1977.

(U) Firing tests were begun in early September 1977 using the Turret Rig which could accommodate both 25mm candidate weapons. These tests were to continue through most of the Phase I program which was scheduled to end in February 1978.

(U) In mid-September 1977 an Infantry Fighting Vehicle Task Force (IFVTF) was established to conduct a Congressionally directed study to reevaluate the specific requirements for, and design of, the IFV/CFV and to assess the need for a more survivable follow-on vehicle. The study directive developed by the IFVTF translated the general guidance into specific alternatives for analysis in terms of effectiveness, cost, affordability and acceptability.

Procurement and Production

(U) : 20mm MICV ED/PEP Contract. A modification for restructuring the engineering design (ED) phase of Contract DAAE07-73-C-0100 was executed on 22 March 1977. This modification provided for replacement of the multiple incentive with a single incentive on cost only. A negotiated settlement was arrived at with regard to fee earned

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under the old multiple incentive; as well as the manner in which both new and existing scopes would be addressed during the balance of the contract. The incentive restructuring provided FMC motivation to control costs for the balance of the ED phase of the contract.

(U) As a result of the program change to an Infantry Fighting Vehicle/Cavalry Fighting Vehicle, with a 2-man turret, 25mm gun and a TOW missile, the 20mm MICV Vehicle work under contract with FMC required modification. A partial Stop Work Order was issued on Contract DAAEO7-73-C-0100, allowing only that work common to the IFV/CFV to continue. An intensive effort was undertaken to restate the original contract in order to adequately reflect the work to be finished. This restatement was complicated by the existence of an undefinitized letter modification to the Producibility Engineering and Planning (PEP) portion of the contract and several undefinitized change orders. The restatement was completed and the Stop Work Order lifted on 9 August 1977.

(U) IFV/CFV Program. Letter Contract DAAK30-77-C-0002 was awarded to FMC Corporation on 4 November 1976. This contract was for Phase I of Engineering Development and encompasses design, development, fabrication and contractor testing of a new 2-man TOW Bushmaster Armored Turret with a 25mm primary weapon and MAG 58 secondary weapon. The contract was to extend for 16 months (February 1978) and was to provide for fabrication of a test rig weapon station, two ED weapon stations (one for a self-powered and one for an externally-powered 25mm gun), and for modification of an existing MICV/Scout Vehicle and ED Vehicle #4 for conduct of contractor testing.

(U) Letter Contract DAAK30-77-C-0052 was awarded to FMC Corporation on 30 August 1977. This contract was for Phase II design and development of both an Infantry Fighting Vehicle (IFV) and a Cavalry Fighting Vehicle (CFV) and encompassed: (1) finalization of the Fighting Vehicle design and development as a logical extension of work previously accomplished or yet to be accomplished under Contracts 0002 and 0100; (2) hardware fabrication; (3) incorporation of Government Furnished Equipment (GFE), to include the transmission selected by the Government for use under this contract; (4) test; (5) test support; (6) test liaison support for primary weapons and ammunition and; (7) redesign and retest as necessary to assure the vehicle met the requirements of the System Specification. The contract was to extend for 32 months and provided for: (1) fabrication of six new turrets; (2) fabrication of eight new automotive chassis; (3) inspect and repair only as needed (IROAN) and update two automotive chasses from Contract 0002; (4) modification and update two prototype turrets from Contract 0002; (5) modification and IROAN of one automotive chassis from Contract 0100 for a test rig to incorporate the upgraded suspension

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system, improved cooling system and other selected changes; (6) design and development of a cavalry kit to adopt the IFV to CFV configuration; (7) logistics support, analysis and training; (8) test and evaluation; and (9) support of Government testing.

(U) Transmission Selection. Contract DAAK30-77-C-0034 was awarded on 1 June 1977 to General Electric Company for the procurement of 11 new IFV/CFV transmissions and four refurbished transmissions. This award was the culmination of a formal Source Selection Program in which the Government solicited, evaluated, and negotiated proposals with a parallel evaluation and testing of transmissions from General Electric and Detroit Diesel Allison Division of General Motors. General Electric was selected as the winning IFV/CFV transmission contractor.

(U) General Support Rocket System. Contract DAAK30-77-C-0005 was awarded to FMC Corporation on 3 June 1977 for the procurement of six GSRS Carrier Vehicles and one FMC facility vehicle. This award was the result of an agreement with the GSRS Project Manager, located at the Missile Command, Huntsville, Alabama, whereby this IFV/CFV derivative vehicle would be the carrier for the MICOM developed Rocket System. Contracts to the two winning rocket contractors were awarded by MICOM on 16 September 1977. The vehicle Contract was for a 32-month Validation Phase ending December 1979 with first vehicle deliveries scheduled for 1 October 1978 to the rocket contractor. The GSRS Vehicle was a modified version of the Infantry Fighting Vehicle, included a man-rated cab and lock-out suspension system, and will feature "Commonality of Parts" with the IFV/CFV.

(U) PCO Transfer. Early in the year, the procuring contracting officer (PCO) responsibilities for development contracts of guns, ammunition, and fuzes were consolidated at TARADCOM, Warren, Michigan, following transfers from ARMCOM, Rock Island, Illinois, and Frankford Arsenal, Philadelphia, Pennsylvania. The consolidation, approved possibilities with the FVS Program Manager's Office. This collocation eliminated extensive travel, reduced the administrative leadtime for procurement actions, facilitated the processing of contract funding documents, and streamlined the procurement management actions of the FVS Armaments.

(U) XM714 Fuze Family. A Memorandum of Understanding was executed by Honeywell and Frankford Arsenal PCO to provide for rental, on a non-interference basis, of an assembly machine line for the sale of approximately \$1.5 million 20mm XM714E1 fuzes by Honeywell to Rheinmetall, FRG. A proposal was submitted to Rheinmetall in June and is currently under evaluation. There are no definite plans for 20mm fuze production.

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(U) Program Manager, FVS, is Tri-Service manager of all XM714 fuze development. This responsibility precipitated the procurement of an XM714E6 30mm fuze development program for use on 30mm HEDP ammo for AAH. A letter contract DAAK30-77-C-0061 with Honeywell was signed on 18 April 1977. The contract was definitized on 27 September 1977 per Modification PZ0003 for \$2,330,581 and was for fuze development and handline fabrication. Program Manager, FVS, is trying to obtain funds for procurement of a machine assembly line for the 30mm fuze.

(U) 25mm XM242 EP Gun (Contract DAAE07-76-C-2051). Due to the restructured vehicle program, it became necessary to procure additional guns to support PQT-G and OT II for the IFV/CFV. A request for quotation (RFQ) was released on 11 May 1977 and clarifying discussions began after receipt of a proposal in late September 1977. Modification to this Firm Fixed Price, hands-off, free-style contract was planned for December 1977.

(U) 25mm XM241 SP Gun and 25mm XM790 Family of Ammunition. Contract DAAA09-75-C-2048 with Ford Aerospace Communications Corporation was restated in March 1977 through Modification P00018 to provide a document in a logical and understandable format. No change in contract price or requirements was realized as a result of the restatement.

(U) Early in the year, the type of developmental ammunition was redistributed within the contract to coincide with program requirements, without changing the total quantity of ammunition. Lower priced rounds were substituted for more expensive rounds with a total reduction in contract price of \$361,776.

(U) Late in the year, an additional 49,900 rounds of 25mm ammunition were purchased and equipment performance report (EPR) processing requirements were incorporated for an additional fee and cost of \$1,168,488. This was necessary to support additional gun and vehicle testing.

(U) Production Management and Control Plan (PMC). A special Task Group was established with representatives selected from the Fighting Vehicle Systems (FVS) Program Office. The responsibilities of the Task Group were to prepare and implement the PMC Plan and to coordinate and exchange appropriate data with Government Agencies and potential prime and subcontractors ultimately involved in the FVS production. This Plan covered all significant production aspects of the IFV/CFV and GSRS Vehicles and was to be updated, as required, throughout the FVS production program. The first draft of the Plan was scheduled for completion during next quarter.

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Armament Engineering

(U) 25mm Gun/Ammunition System. The 25mm Weapon Program continued with the two candidate weapons undergoing contractor development activities. A Tri-Service Review of both weapons (and the 25mm ammunition) was held at Ford Aerospace and Communications Corporation on 7-8 October 1976. Contractor briefings on both weapons were presented to an audience of Army, Navy and Air Force personnel.

(U) Development continued on the XM241 Self-Powered 25mm Weapon by Ford Aerospace and Communications Corporation (FACC). The fabrication of the three Developmental Model (DM) Guns was completed, and one was delivered for system integration testing by FMC Corporation, the IFV/CFV vehicle developer. Endurance testing (approximately 17,000 rounds) was conducted on the second gun. PQT-C firing tests were initiated in September 1977 on the third gun with approximately 100 rounds fired that month of a planned 7000 round PQT-C test, which was scheduled for completion by 20 January 1978.

(U) The design concept of a remote ammunition feed select actuator for the XM241 was defined by a cooperative effort of the gun contractor (FACC), the vehicle contractor (FMC) and the Program Management Office. It was an electrically powered actuator to allow for rapid selection between High Explosive (HEI-T) round and Armor Piercing (APDS-T) by the gunner. FACC was proceeding with the development of this item, which was considered a vehicle-mounted gun component; and was to deliver necessary quantities for Government and Vehicle Contractor Tests.

(U) Two Oerlikon KBA-B02 baseline 25mm guns were procured through FACC and were delivered to the fuze developer (Honeywell) and the ammunition LAP contractor. They were being used for necessary component test support firings.

(U) Development of the other 25mm contender, the XM242 Externally-Powered 25mm Weapon, continued by Hughes Helicopters. The prototype design was completed and four prototypes have been fabricated. One gun had been provided on a loan basis to FMC, the vehicle contractor, for integration and system development testing. The other weapons had been in use by Hughes for development and endurance testing under their unique "hands-off" contract (no Government direction). Over 20,000 rounds were fired on the endurance gun by Hughes.

(U) It was decided to conduct the PQT-G 25mm Hardstand Test, which was planned for FY 1978, using vehicle-type ammunition ready boxes and flexible chuting. Action was taken to provide four complete sets of these items to Aberdeen Proving Ground (APG) and to

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lend one set of boxes and chutes to each gun contractor for check-out testing as a system prior to the initiation of PQT-G. These were being ordered from FMC to the latest available vehicle configuration.

(U) Both gun contractors submitted safety statements on their weapons. These will be used as part of the background information leading to manned firings by FMC and the Government.

(U) The 25mm Ammunition Program continued with Ford Aerospace and Communications Corporation (FACC) developing the XM790 family of ammunition - the Americanized, production engineered and improved version of the Oerlikon ammunition for their KBA-B02 gun. To date, over 100,000 rounds of ammunition (primarily the XM792 TP-T cartridge) were manufactured to support not only the development of the ammunition, but also the XM241 and XM242 guns, the XM714E5 fuze, and the XM2 and XM3 vehicles. Type classification of this ammunition was scheduled for 4th Quarter FY 1978 or 1st Quarter FY 1979 following several months of PQT-G testing.

(U) Smooth-bore test results as well as limited component development testing indicated that the penetration requirements were met with the XM791 APDS-T ammunition. FACC was conducting the component definitization phase in the development of this cartridge, which was scheduled for completion by mid-February 1978. The only component which appeared to be a potential problem at this time was the sabot due to poor performance at the temperature extremes; however, its performance was satisfactory across a limited temperature range.

(U) Both the exterior ballistic and lethal area testing were completed on the XM792 HEI-T ammunition and the results indicated that the requirements in these areas had been met; therefore, a successful projectile design had been attained. The development of this cartridge, including its fuze - the XM714E5, was completed and the PQT-G test quantities are now being manufactured.

(U) XM714 Fuze Program. Development of the XM714E5 fuze for the 25mm XM792 HEI-T cartridge continued at Honeywell, Incorporated. Based on development testing results, the fuze design was finalized and the automatic production line completed. Government verification (on the handline fuzes) and qualification (on the production-line fuzes) tests were under way at Aberdeen Proving Ground.

(U) In April 1977, a letter contract was awarded to Honeywell to develop a 30mm fuze, the XM714E6, for the Advanced Attack Helicopter (AAH) HEI and HEDP ammunition. The first phase of this fuze development was completed, and the completion of the second phase will lead to type classification, scheduled for July 1978.

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(U) XM236 (M139 PI) 20mm Gun. Development and improvement of the dual feeder was completed, and this gun program was terminated with the redirection of the IFV/CFV program. No one-man turrets were to be produced, and no 20mm weapons were to be used in two-man stations; hence, the program had no need for this weapon. The Technical Data Package was completed and filed for possible future applications. At the completion of the hardstand tests of the gun and feeder, the system exhibited a Mean Rounds Between Stoppage (MRBS) of 9000.

(U) XM231 5.56 Firing Port Weapon. Development continued on the XM231 Firing Port Weapon, the selected weapon for IFV/CFV application. A comparison test of BRL and Rodman Laboratory versions was conducted, and the BRL modified striker version was selected for further refinement and vehicle application. The gun featured a 14-1/2" barrel, enclosed bolt carrier and improved stacker. An additional version was also considered in the last half of FY 1977. This was a Hammer Fire version developed by ARRADCOM with separate funding, with the objective of increased reliability at all temperatures. However, the Hammer Fire version failed to perform up to expectations and was dropped prior to a scheduled TECOM test, leaving the BRL modified striker version as the selected weapon. This version has demonstrated the capability to meet system requirements. The XM231 interface with the vehicle was modified after an incident where the retaining pin holding the gun in the ball mount came out. The gun was fired inside the vehicle causing crew injury. This resulted in a more positive mounting, (360° rotation) of the gun in the ball mount. Also, an integral safety pin, provided a double safety lock retaining the gun to the mount. This mounting concept was tested and approved for vehicle application.

(U) M240 (Modified MAG 58) 7.62mm Coaxial Machinegun. The M240 machinegun was the adopted US coaxial machinegun and was being used in several programs including XM1 and M60 series tanks. Made in Belgium by Fabrique Nationale, it was under procurement by ARRCOM. The IFV/CFV used this gun and was scheduled to receive 16 weapons. However, the configuration of the 2-man turret for the IFV/CFV required a right-hand feed version of the gun while all other U.S. applications were left-hand feed. Initially, this was being done by right-hand conversion kits also under contract through ARRCOM. These kits included feed mechanisms and pawls for right-hand feed. Action had been taken to request a new type designator (XM number) and National Stock Number (NSN). In the interim, four used MAG 58 weapons from prior Government testing were provided to FMC for vehicle integration activity.

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Vehicle Systems

(U) Phase I Contract. On 3 November 1976 a sole source development contract was let with FMC to develop a new Fighting Vehicle incorporating a new turret and a chassis based on MICV components. The first phase was to develop the turret and portions of the chassis with a second phase starting in August 1977 that would provide the required number of vehicles for contractor and Government test phases. Phase I also provided a test rig turret and several thousand rounds of 25mm/7.62mm firing during the September 1977 - January 1978 time frame. MICV was renamed the Infantry Fighting Vehicle (IFV), XM-2, and the MICV/Scout redesignated Cavalry Fighting Vehicle (CFV), XM-3. The IFV/CFV was a full tracked, highly armored vehicle which incorporated a fully stabilized two man turret mounting an integrated day/night (thermal) sight, a 25mm automatic gun, 7.62mm machine gun, and TOW missile system. This vehicle was capable of being transported in the C5A and C41 aircraft and could swim. The primary differences between the IFV and the CFV was in the size of the crew (nine men in the IFV and five men in the CFV) and their mission oriented equipment. Differences in crew size, together with the differing stowage arrangement dictated an internal configuration peculiar to each vehicle.

(U) IFV Nine Man Crew. Based on the decision to adopt a 2-man turret, TOW missile and 25mm ammunition internal stowage/configuration changes had to be made. It was determined that due to the increased stowage volume required, and adding the larger turret, there was not room for nine dismountable crew members. Consequently, the total crew was reduced from eleven to nine with only seven dismountable infantry men.

(U) IFV/CFV Commonality. The IFV/CFV were identical externally. Their differences were as follows: the IFV carried nine men and their individual weapons, the CFV five; the IFV had six firing port weapons and three LAWS, the CFV none; and the IFV stowed a combination of five TOW/DRAGON missiles, the CFV stowed ten TOW. In addition, the CFV stowed a motorcycle. The radios also were different. Whereas the IFV had the AN/VRC-46 and AN/GRC-160, the CFV had the AN/VRC-12 and AN/PRC-77. The above items plus the amounts of food and ammo stowed were the only differences between the two vehicles.

(U) Two Man Turret (TOW/25mm Gun/M240 Coax). The MICV one-man weapon station mounted a dual feed, rapid fire 20mm automatic gun (XM236 and a 7.62mm coaxially mounted machine gun (XM238). This one-man station was provided with an electrohydraulic powered, stabilized drive system with manual back-up. The M36E2 integrated day/night gunner's fire control/observation system provided 1X and 7X day and 7X passive (Image Intensification) sight capability.

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(U) With the conversion to a two-man turret, the commander's station in the MICV (behind the driver) was eliminated and the commander was placed inside the turret. While the commander was located on the right side, the gunner was on the left side of the turret. The two-man turret mounted a dual-feed, rapid fire 25mm automatic weapon (either the self-powered XM241 or the externally-powered XM242), a 7.62mm coaxially mounted machine gun (XM240) and a two-tube, TOW launcher system. Also, the two-man turret was provided with a dual control, electrically powered, stabilized drive system, with manual back-up. A new design integrated day/night gunner's fire control/observation system provides unity, 4X and 12X day and 4X and 12X passive (thermal) night viewing capability.

(U) Concurrently with the decision to initiate the IFV/CFV program, the MICV program continued to correct problems encountered during the previous years and prepared for a PQT-G/OT II phase starting in October 1976. In Spring of 1977 a Source Selection Evaluation Board (SSEB) was constituted to evaluate the results of comparative testing of the Allison X-300-4A and the G.E. HMPT-500 conducted at APG and Fort Benning. Based on this evaluation, the Source Selection Authority (SSA) chose the G.E. Transmission for continued use in the IFV/CFV.

(U) Although the idler had been strengthened, and road wheel/track guide changes had been made prior to start of PQT-G/OT II, these changes were not sufficient to field a high mobility vehicle such as the MICV/IFV. With the completion of the PQT-G in March 1977, it became apparent that an extensive redesign of the suspension was needed. A task force was convened to address the needed changes and to determine what would be needed for the heavier IFV/CFV vehicles. Several changes were recommended in the area of shock absorbers, torsion bars, idler mount, sprocket and track. While some changes were to reduce weight such as torsion bars, the others were primarily to correct mobility problems. The designs were being fabricated and system tests were to be underway in May of 1978.

(U) Final tests of full water barrier were successfully completed in June 1977. The full barrier was planned for the IFV vehicles.

(U) Prior to the termination of the MICV in March, other areas that were being redesigned were successfully tested. These included a revised driver and commander station with pop-up hatches, improved deck clearance system, and an improved M36E2 sight. The sight work was continuing as a back up program for the IFV, should the integrated IFV/CFV gunner sight have problems. A revised stowage arrangement to allow better squad egress was also successfully tested. Application of smoke grenade launchers and relocation of the starter were being

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applied to the present IFV/CFV program. Tests of these items on the IFV was to occur in the Spring of 1978.

(U) One area of improvement for increased maintainability and to provide a greater margin of safety during high ambient (125°F) high power demand situations was a redesign of the cooling system. Tests of the new system were to occur in early 1978.

(U) Phase II Contract. In August 1977 the Phase II letter contract was let with FMC to continue the design and development effort begun with the Phase I contract let in November 1976. Phase II will include continuing development of the two man turret and making corrections to the MICV chassis to upgrade it to the IFV configuration.

(U) This contract also included fabrication of six new turret assemblies and modification and update of two prototype turrets initially fabricated under Phase I. It also included fabrication of one test rig, eight new chassis, and modification and update of the two chassis initially fabricated in Phase I. Complete development tests of two ED turrets and 12,000 miles of test rig operation will also be conducted in preparation for a PQT-C starting in September 1978.

Program Management

(U) General. The combined programs presently managed by this office represented an anticipated expenditure of \$276 million in RDT&E funds from the inception of the program through FY 1982, and over \$3 billion in procurement funds during the period FY 1977 through FY 1990. Operationally, these programs represented the capability, which was not then available, that will be in the field through the late 1990's.

(U) Program and Fiscal Resources. Fiscal Year 1977 RDT&E program in the amount of \$57.146 million was received from DARCOM and customer orders. Status of Allotment reports as of 30 September 1977 for fiscal years 1974 through 1977 were reviewed, their accuracy verified, and the reports certified. The results of this review were summarized for FY 1977:

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| <u>Program</u> | <u>Program Authority (\$000)</u> | <u>Obliga- tions</u> | <u>Percent of Obligation</u> |
|--------------------------------------|--|--------------------------|----------------------------------|
| Infantry Fighting Vehicle (IFV) | \$27,920 | \$27,574 | 98.8 |
| Cavalry Fighting Vehicle (CFV) | 3,970 | 3,966 | 99.9 |
| Fighting Vehicle Armament Sys (FVAS) | 20,000 | 19,971 | 99.9 |
| Firing Port Weapon (FPW) | 1,350 | 1,350 | 100.0 |
| Advanced Attack Helicopter (AAH) | 700 | 700 | 100.0 |
| General Support Rocket Sys (GSRS) | 3,204 | 3,171 | 99.0 |
| ARRADCOM | <u>2</u> | <u>2</u> | <u>96.9</u> |
| TOTAL | \$57,146 | \$56,734 | 99.3 |

(U) Joint reviews were conducted with the TARCOT Comptroller's Office of all unliquidated obligations against their source documents.

(U) A continuing review of the funding status of current and prior year programs provided a recoupment of \$166 thousand against the D340 Gun Systems line. This recoupment was applied against FY 1977 requirements. Recoupment of \$56 thousand was also made against the D258 MICV XM723 line.

(U) An update of the RDT&E, procurement, and O&MA budgets was prepared for the period FY 1979 through FY 1983. This served as an input to DARCOM planning records.

(U) RDT&E Data Sheets for FY 1978 through FY 1983 were prepared and submitted to DARCOM in January. This data was used as an input to DARCOM planning records. It also included a request for additional funding to accommodate TRADOC; expanded requirements for Trainers, the Improved Technical Documentation and Training (ITDT) concept, and TBAT II contingency.

(U) At the request of DA, a Zero-Based RDT&E Budget for FY 1978 through completion of the program was submitted for the MICV and VRFWS programs in February. The data submitted was used by DA in the RDAC Budget Reviews.

(U) In accordance with provisions of AR 37-108, the TARCOT Comptroller, Finance and Accounting Division, accounting records related to the PM, MICVS Allotment 6D-3473 were reviewed as of 30 December 1976. Also, supporting documentation for all unliquidated obligations was examined.

(U) Fiscal year 1977 RDT&E funds in the amount of \$1.2 million were received from the PM, General Support Rocket System (GSRS) to design and develop a chassis to be used as a carrier vehicle for the

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rocket system. It was anticipated that total program effort by the FVS office on the GSRS project will exceed \$33 million.

(U) The PM, Advanced Attack Helicopter (AAH) provided FY 1977 RDT&E funds in the amount of \$700 thousand to initiate development and fabrication of approximately 75,000 XM714 type fuzes for the 30mm ammunition program.

(U) Plans and Operations. The MICV Systems program underwent a sequence of review within the Army and OSD. The result of these reviews resulted in the redefinition and redirection of the MICV program to: (1) continue the current development effort with MICV/20mm interim system; (2) limit the procurement of the MICV/20mm interim system to two years (FY 78 and FY 79); (3) incorporate the TOW Missile System (two launch tubes) on the MICV as a supplemental armament; (4) enlarge the weapon station to accommodate two persons; e.g., the commander and the gunner, rather than the current one-man design; and (5) to designate MICV as a common vehicle for both mechanized infantry and Scout use. The MICV/Scout configuration was to be modified in the interior to accommodate differences required for the Scout mission. These changes were approved on 3 November 1976 by the Secretary of the Army.

(U) On 25 January 1977, the FY 1978 Interim Vehicle procurement was cancelled as a part of an overall budget reduction and on 29 March 1977, the Vice Chief of Staff, Army, approved terminating the 20mm MICV program. This decision will permit application of all resources to the TBAT II (approximately \$2.5 million) to permit entrance into PQT-G and OT II with new, rather than overhauled chassis. In addition, the Army will not be required to support two different MICV configurations.

(U) The GAO conducted a study for the purpose of revising the XM-1 and the FVS programs as they relate to the combined arms concept. Issued by the GAO, the report resulted in the submittal of a rebuttal correcting the errors made by GAO. The rebuttal also explained that the tactical doctrine for the FVS was different, and stressed that the requirement for compatibility with the XM-1 did not mean there was a requirement for comparability.

Management Information

(U) 1 October 1976 - 31 December 1976. During the period of October - December 1976 efforts continued towards developing and implementing a MICVS Key Milestone Planning and Control System (KMPCS). In October, test runs of two candidate computer programs were conducted

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to determine the advantages/disadvantages of each and to become familiar with both the programs and the computer equipment. The PERT/TIME program was run on the Picatinny computer while PMS IV was tested on the AVSCOM computer. As a result of these tests, it was determined that PERT/TIME was best suited for our short-term (6-9 mos) computer needs. Availability of the program and required interface equipment were the key determining factors.

(U) The MICVS Master Schedule also was developed during this timeframe. The Master Schedule graphically portrays all of the vehicle and gun schedules on a single 30" x 40" sheet. It is updated monthly and disseminated not only to all the PMO offices, but several other government and contractor sites as well. For the test runs mentioned above, the MICVS Master Schedule was converted into network form, coded and loaded into the computer. By using the PERT/TIME program random changes can be made to the Master Schedule and the impact determined on subsequent activities.

(U) In developing a Milestone System for MICVS it was discovered that the PMO lacked an overall program work breakdown structure (PWBS). Several WBS's were in existence for the various contracts; i.e., vehicle engineering design (ED), and 25mm SP gun PE&I. However, they were found to be deficient in terms of consistency and degree of detail. To overcome this problem, Harbridge House was tasked with developing a MICVS Program WBS which was completed and delivered to the PMO in December. In subsequent months the PWBS will be used for request for proposal (RFP) and contract preparation, cost and schedule monitoring and control, and specification tree development.

(U) Prior to awarding the Phase I ED contract for TBAT II, the Project Manager asked this office to work closely with FMC in laying out detailed milestones and footstones for the Phase I effort. This was accomplished. The product was a monthly breakout of all design, fabrication, testing, procurement and subcontract milestones. Schedule status was to be reported against these milestones beginning in January 1977 with critical path milestones flagged through the use of a schedule overlay.

(U) An analysis of the current producibility engineering and planning (PEP) schedule revealed inadequate milestone identification for satisfactory PMO management. Additional milestones were incorporated into the PEP schedule for high dollar work packages (greater than \$100K) and selected component qualification tests. Progress against these milestones will be reported to the PMO on a monthly basis.

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(U) The final major activity initiated in December was to assemble a listing of all key PMO in-house milestones for the next 12 months. This listing will be updated quarterly with status reported on a monthly basis. As one quarter is completed, a new quarter will be added on the distant end so that a 12 month projection of milestones will always be visible. Like the other milestones mentioned above, the in-house milestones will be loaded into the computer and monthly status reports provided to the Division Chiefs and APM's. Key contractor and PMO in-house milestones will also be summarized and displayed in the MICVS Control Room.

(U) 1 January - 30 June 1977. During this period, the FVS Milestone Control System (MICOS) became fully operational. The first monthly milestone reports were provided to APM's and Division Chiefs in January. These reports contained contractor milestones, PMO milestones, contract requirements and Government Furnished Property requirements for all FVS projects. Upon being updated, these reports were used as inputs for monthly milestone control meetings, which began in February.

(U) At the milestone control meetings, key contractor and PMO personnel reviewed milestone accomplishments, delays/changes and future milestones for all FVS projects. Scheduling problem areas were highlighted along with potential impact of schedule slippages. Responsibility for corrective actions was assigned.

(U) In March 1977 this office began to prepare and distribute a MICOS Newsletter following each Milestone Control Meeting. The newsletter summarizes discussions, identifies required/directed actions and provides an assessment of overall schedule status. It was also an important tool for following up on assigned actions from meeting to meeting.

(U) The FVS Master Schedule became the major planning/scheduling document used in the PMO. Upon being updated, more than 125 copies of this schedule were distributed to PMO offices, all FVS contractors, and supporting government agencies. Efforts were underway to install a magnetic schedule board in the FVS Control Room for the FVS Master Schedule. Critical path activities were to be displayed on an adjoining magnetic board.

(U) In May, FMC instituted a similar schedule control system to MICOS. FMC maintained a Control Room which paralleled that of PM, FVS. Milestone control meetings were held recurrently to insure that scheduled tasks were satisfactorily managed. Responsibility for schedule control was centralized directly under the FMC program director. The above changes resulted in a significant improvement in schedule control and communications with the PMO.

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(U) 1 July - 30 September 1977. During the period July - September 1977 the FVS Milestone Control System (MICOS) matured to become the major management system employed in the PMO. The style and format used during the monthly MICOS meetings with contractors was changed to include presenting milestone data in both narrative and graphic format; i.e., milestones by sub-project displayed in words and network schedules. This was a significant improvement to the system since milestone interrelationships and planned milestones can be better understood.

(U) The success of MICOS was made evident by numerous requests for briefings and information on the system from outside government and contractor organizations. Considerable effort was expended in assisting the XM-1 Tank PMO to bring on-line a system similar to MICOS.

(U) A new computer graphics terminal (Textronix 4014) was installed in the PMO in September. This terminal provided expanded capability for plotting of cost and schedule data, and was used on a time-share basis with computers at Picatinny Arsenal and GSA Atlanta. Additional uses planned for the terminal included the plotting of RAM-D, ILS and engineering data.

(U) Preparations were underway for the first annual FVS Management Review to be conducted at the Naval Postgraduate School in Monterey, California, during 31 October - 3 November 1977. This review will cover major management issues facing the FVS program in FY 1978. All contractors and major subcontractors will participate.

(U) In September 1977 efforts were undertaken to integrate the cost and schedule control functions within the PMO. Up to this point the Management Information Office handled schedule matters while cost control was the responsibility of Program Management Division. Under the current plan, the Management Information Office will become part of Program Management Division. This planned reorganization and mission changes should significantly improve the total cost/schedule control efforts within the PMO.

XM1 Tank System

Forward

(U) During this period, the extended validation phase of the XM1 development program was completed. Both prime contractors, Chrysler and General Motors Corporations, were extended to allow for resolicitation to incorporate standardization items into their Full Scale Engineering proposals.

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(U) The decision was made by Department of Defense on 12 November 1977 to allow the XM1 Tank System to enter into Full Scale Engineering Development. Chrysler Corporation was selected as the prime contractor to build the prototypes and handle the producibility, engineering, and planning.

(U) The objective of the XM1 Tank System Program was to develop and field a main battle tank for use during the 1980 time frame and beyond.

Organization

General

(U) The Office of the Project Manager, XM1 Tank System, continued as a Class II activity of Headquarters, US Army Materiel Development and Readiness Command. On 12 July 1977, Brigadier General (P) Donald M. Babers was assigned as Project Manager replacing Major General Robert J. Baer. The XM1 Project Office was located at 28150 Dequindre, Warren, Michigan 48092. Field offices are located in Washington, D.C.; Bonn, Germany; Picatinny Arsenal, New Jersey; Aberdeen Proving Ground, Maryland; and Fort Knox, Kentucky.

Mission

(U) The Project Manager was responsible for the development, procurement, production, testing, distribution, and logistical support of the XM1 Tank System and related ancillary equipment. He was also responsible for national and international 105mm and 120mm tank main armament development programs, and for the US portion of the German-American Tank Harmonization Program.

Personnel

(U) To accomplish the assigned mission, the Project Manager's authorized strength was increased from 128 to 139 spaces during this period. The authorized strength included 45 military and 94 civilian positions.

(U) The increase of 11 total spaces was phased as follows: 1 October 1976 - 1 civilian; 26 January 1977 - 1 military; 10 March 1977 - 1 civilian; and 13 May 1977 - 8 military. During the fourth quarter of this reporting period, the Fort Knox, Kentucky, field office was established.

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(U) The chart on the next page shows the organizational structure and key personnel of the Project Manager's Office as of 30 September 1977.

Significant Events

General

(U) The XM1 Tank System was a high visibility project. Considerable effort was required to keep the principals in the chain of command and Congress informed of project progress.

Defense Systems Acquisition Review Council (DSARC)

(U) On 10 and 11 November 1976, the Army presented a review of the XM1 to DSARC principals. This presentation was extremely complete and, coupled with the XM1 tank presentation of 20 July 1976, provided a sound basis for further progress in this important program. Based on this review and recommendations from the DSARC principals, the Secretary of Defense authorized the Army to proceed with the XM1 Tank Full Scale Engineering Development (FSED) program.

(U) The DSARC supported the Army recommendation to adopt the turbine engine and concurred with the incorporation of a dual capable turret which can accommodate either a 105mm or 120mm gun. This approval was consistent with the design to unit production cost which had been established for the XM1 tank program and discussed with the Congress. The DSARC recognized that other components of the tank (track and suspension components, metric fasteners, sights and fire control, and night vision devices) did not appear to influence performance, costs, or schedules significantly. However, the DSARC urged that these components be selected so as to further NATO operational effectiveness and logistical support, insofar as possible.

(U) Subsequently, the Army prepared a revised Decision Coordinating Paper (DCP) to record the DSARC decisions on the XM1 Tank FSED Program and the Secretary of the Army's source selection decision. The revised DCP 117A was submitted to DA on 9 March 1977. At the conclusion of the fiscal year, the DCP was being reviewed by the Office of the Secretary of Defense.

Congressional Hearings

(U) On 14 and 15 March 1977, Major General Baer appeared before the House Appropriations subcommittee along with the Honorable Edward A. Miller, ASA (R&D), Lieutenant General Howard H. Cooksey, Deputy

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OFFICE OF THE PROJECT MANAGER, XMI TANK SYSTEM, DARCOM
KEY PERSONNEL ASSIGNMENTS

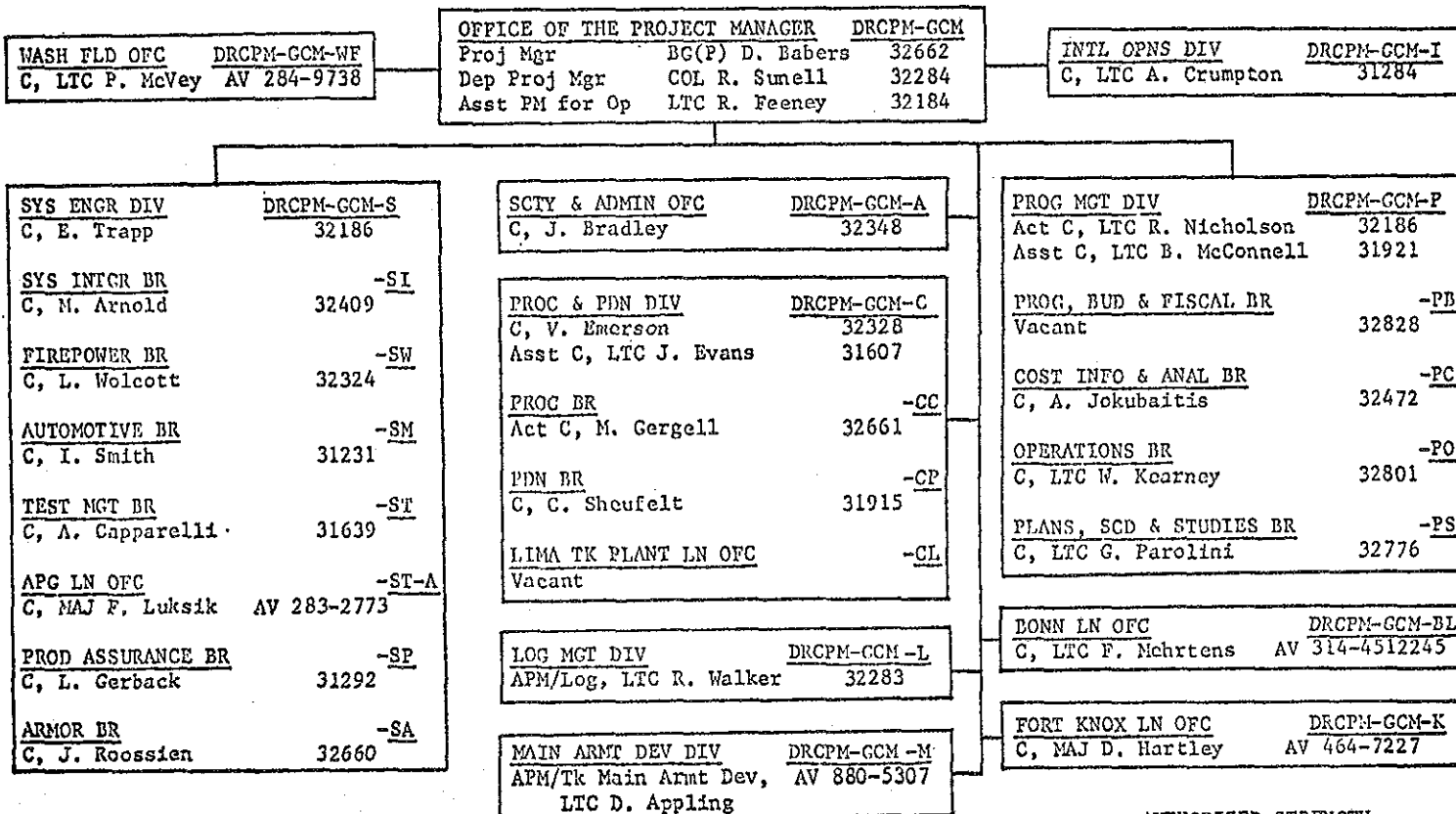


Chart 21

| | AUTHORIZED STRENGTH | |
|-------|---------------------|----------|
| | AUTHORIZED | ASSIGNED |
| OFF | 41 | 30 |
| WO | 1 | 0 |
| EM | 3 | 3 |
| CIV | 94 | 88 |
| TOTAL | 139 | 121 |

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Chief of Staff for Research, Development and Acquisition, and Richard V. Kearney, Principal Deputy Army General Counsel. FY 1978 budget issues covered included the Neodymium and Ruby laser rangefinder program, thermal sight program, the performance of the XM1 tank versus the Leopard 2 tank, impact of design changes, tank main gun development program, turbine engine development program, turbine growth potential, production, and Integrated Logistic Support Planning.

(U) On 25 and 28 March 1977, Major General Baer appeared before the House Armed Services Committee along with the individuals named above. Areas discussed included the program objectives, tank main armament development program, Full Scale Engineering Development Logistics Support Package, and production phase funding.

(U) On 1 April 1977, Major General Baer appeared before the Senate Armed Services Committee with the ASA(R&D), the Honorable Edward A. Miller. Issues covered during the hearing dealt with the program cost, armor development, standardization, 120mm gun procurement, contractor performance, and facilitization.

General Accounting Office (GAO) Inquiries

(U) The General Accounting Office completed three inquiries that concerned XM1 Tank System operations and was in the process of acquiring additional data on one open inquiry.

(U) A GAO Review entitled: Selecting Production Site for Army's New Main Battle Tank examined the Army's selection of the Lima Army Modification Center as a site for production of the XM1. The review supported the Army's decision to produce the XM1 tank at the Lima Army Modification Center, Lima, Ohio.

(U) The inquiry into the Army's Acquisition and Use of Close Combat Vehicles, which reviewed the development of both the XM1 Tank and Fighting Vehicle System (FVS), concluded that the two systems were designed to complement each other in firepower; however, because of differences in mobility and survivability characteristics their joint combat effectiveness on the battlefield could be affected.

(U) In its inquiry, Consideration Given to the Federal Republic of Germany's Leopard 2 AV as the Army's New Main Battle Tank, the GAO criticized the Army's handling of the Leopard 2 AV evaluation. The first report was rewritten, and although the rewritten report was not as critical as the original, it still did not accurately reflect the Army's position regarding the evaluation. The Army's position that the tests were fair and impartially conducted was supported by the

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Investigations Subcommittee of the Committee on Armed Services,
House of Representatives in Report 95-35 dated 23 September 1977.

(U) The GAO inquiry entitled: Analysis of Main Battle Tank Procurement was designed to assess the economic consequences of alternatives for main battle tanks. This review was on-going, with a target date for completion in the first quarter of FY 1978.

US/FRG Harmonization Executive Group

(U) As a result of the US/FRG Harmonization Memorandum of Understanding (MOU) of 11 December 1974, the US and FRG established an executive group as well as a subordinate working group. Brigadier General (P) Babers, Project Manager, XM1 Tank System was US Chairman of the executive group.

(U) A total of four executive group sessions took place between October 1976 and October 1977, three of which were chaired by Major General Baer and one by Brigadier General (P) Babers in conjunction with his German counterpart. The executive group sessions served primarily to implement the Harmonization MOU, to give guidance to the working group, and to review the progress achieved concerning the Leopard 2 cost and producibility study and DT/OT I testing.

Significant Briefings and Visits

(U) Significant briefings and visits during the reporting period were as follows:

(U) a. Briefings/visits with foreign government representatives:

General I. Tal, Assistant Minister of Defense, Israel - 2-3 November 1976. General Tal was provided an in-depth briefing on the XM1 Program and the system's capabilities.

Brigadier General J. Willis, United Kingdom - 28 November 1976. Brigadier General Willis received a general program overview briefing to include the technical capabilities of the system.

Mr. Hans Scheel, Assistant Defense Research Attache, Embassy of the Federal Republic of Germany - 14 December 1976. The general XM1 program briefing was presented to Mr. Scheel by the Deputy Project Manager. After the briefings by the Chrysler Sterling Defense Engineering Division on the XM1 Program, a tour was made of the Detroit Army Tank Plant.

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Major General Bertrand De Montaudoin, Director, School of Military Scientific Studies, Republic of France - 16 December 1976. A standard briefing on the XML tank development program was provided Major General De Montaudoin and party. The purpose of the visit was to exchange ideas and philosophy of the main battle tank of the nineties.

Brigadier General Clayton Gordon Kitchen, Canadian Forces Attache (Land), Canadian Defense Liaison Staff, Canada - 19 January 1977. Brigadier General Kitchen was provided a general program briefing on the XML Tank System. A visit was made to the Chrysler Sterling Defense Plant where Brigadier General Kitchen received a briefing by Chrysler personnel.

M. G. L. Wylie, Chief of Engineering and Maintenance, Canadian Armed Forces, Canada - 10 February 1977. The XML Deputy Project Manager presented a general program briefing and discussed the technical capabilities of the XML Tank System.

Major General A. M. L. Hogge, Director General Fighting Vehicles and Engineering Equipment, United Kingdom - 24-26 April 1977. The Project Manager presented the XML briefing update to Major General Hogge and a discussion was held on the United Kingdom's intent in the XML Program. On 26 April 1977, Major General Hogge traveled to Chelsea Proving Ground for a briefing by Chrysler Defense Engineering and inspected and drove the automotive test rig.

Brigadier General Borje Gahnberg, Director of Maintenance, Swedish Defense Materiel Administration, Sweden - 29 April 1977. Brigadier General Borje Gahnberg, and Colonel Curt Hauffman, Head of Technical Division, Maintenance Directorate, Swedish Defense Materiel Administration, visited AVCO Lycoming, Stratford, Connecticut on 29 April 1977. The purpose of the visit was to discuss the reliability, availability, and maintainability program for the AGT-1500 gas turbine engine.

Major General Toshiyuki Shinozaki, Chief, Ordnance Division, Ground Staff Office, Japan Defense Agency, Japan - 22 June 1977. Major General Shinozaki visited Chrysler Corporation Sterling Defense Plant and the XML Project Office. He received briefings on the production of armored vehicles and the funding of contracts for industry Research and Development.

Major General Pieter W. Maris, Commanding General, Directorate Materiel, RNL Army, Netherlands - 27-29 June 1977. Major General Maris received the XML program briefing to include discussions on the technical capabilities of the system. He also visited Chrysler's Chelsea Proving Ground for a briefing by Chrysler Defense Engineering and to inspect and drive the automotive test rig.

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Major General A. Rotem, Israeli Defense Force, Israel - 28-29 June 1977. An XML program briefing and discussion period was provided Major General Rotem. He visited Chelsea Proving Grounds where he received briefings by Chrysler Defense Engineering and inspected the automotive test rig.

Brigadier General Louis Rene Daumard, Consular for Armaments, Chief of Staff, French Army, French Ministry of Defense, France - 20 July 1977. Brigadier General Daumard received the standard program briefing to include the technical capabilities of the system.

Brigadier General J. Hamilton Jones, CBE, Director General Weapons (Army) Ministry of Defense, United Kingdom - 25-26 July 1977. Mr. Trapp, Chief Systems Engineering Division, presented a detailed engineering briefing on the XML Tank System. A briefing concerning installation of a 120mm tank gun in the XML tank was held at the Chrysler Sterling Defense Plant.

(U) b. Significant briefings/visits with Department of Defense personnel:

Brigadier General David K. Doyle, DCG, USATC, Fort Knox - 12-13 October 1976. Brigadier General Doyle received an XML program briefing, enroute to Milford, where General Motors presented briefings and Brigadier General Doyle observed their pilot vehicle. On the afternoon of 12 October 1976, Brigadier General Doyle and party traveled to Chelsea for similar briefings by Chrysler and to observe their automotive test rig.

Brigadier General John W. Woodmansee, Chief Combat Development Group, TRADOC - 14 February 1977. A program update briefing of the XML was presented to Brigadier General Woodmansee by the Project staff. The briefing included technical changes made by Chrysler in their Full Scale Engineering Development proposal and status of Government Furnished Equipment, user changes requested, Integrated Logistics Support and Training, 120mm Gun System Evaluation, Leopard 2 AV Evaluation Plans, and the Turbine Maturity Program.

Major General Patrick W. Powers, Commanding General, US Army Test and Evaluation Command, Aberdeen Proving Ground - 15 February 1977. Major General Powers visited Chrysler's Sterling Defense Division where he received briefings on the technical characteristics of the XML tank.

Mr. George Foster, Staff Member, Senate Armed Services Committee - 17 February 1977. In preparation for the FY 1978 Congressional Budget Hearings, the Project staff briefed Mr. Foster in-depth on all aspects of the XML Program.

Armor Association - 16-19 May 1977. The Project Manager addressed the members of the Armor Association at Fort Knox, Kentucky, where he presented a program overview to include a discussion of 105mm Tank Gun Ammunition. A classified briefing on the threat and the results of testing was provided in closed session.

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General John R. Guthrie, Commander, US Army Materiel Development and Readiness Command - 10 June 1977. The Project Manager briefed General Guthrie on XML system capabilities.

General John R. Guthrie, and General Hiroomi Kurisu, Chief of Staff, Ground Self Defense Force, Japan - 20-21 June 1977. General Kurisu, accompanied by General Guthrie, was provided a tour of the Detroit Army Tank Plant and a general overview briefing on the XML Tank System.

Lieutenant General George Sammet, Deputy Commanding General for Materiel Development, DARCOM - 27-28 July 1977. Lieutenant General Sammet made a farewell visit to the Project Office.

Major General John W. McEnery, Commanding General, US Army Armor Center (USAARMC), Ft. Knox and Brigadier General David K. Doyle, Assistant Commandant, US Army Armor School (USAARMS), Fort Knox - 2 August 1977. The Project Manager escorted Major General McEnery and Brigadier General Doyle to the Chrysler Sterling Defense Plant for informal briefings and a review of the mock-up.

Brigadier General Philip I. Bolte, Deputy Commanding General, USA, Test and Evaluation Command, Aberdeen Proving Ground, Maryland - 2-4 August 1977. Brigadier General Bolte visited the Chrysler Sterling Defense Plant for a mock-up review.

Major General Glenn K. Otis, Deputy Commanding General, USA Combined Arms Combat Development Activity, Fort Leavenworth - 11 August 1977. Major General Otis visited the XML mock-up at the Chrysler Sterling Defense Plant.

Major General Charles K. Heiden, Commanding General, US Army Military Personnel Center - 18 August 1977. Major General Heiden received a program overview briefing and visited Chrysler Sterling Defense where he observed the mock-up.

American Defense Preparedness Association, Fort Knox, Kentucky - 9 September 1977. The Project Manager delivered a progress report on the XML tank to include a program summary update, hardware update, and the project's preparations for production.

Major General Julius W. Becton, Jr., Commanding General, US Army Operational Test and Evaluation Agency - 12 September 1977. Major General Becton was provided the XML Program Update Briefing, which covered the areas of training, logistics, and testing.

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General Donn A. Starry, Commanding General, USA TRADOC - 14 September 1977. General Starry received the XML Program Update Briefing including Full Scale Engineering Development changes and 120mm gun integration planning. He also visited Chrysler Sterling Defense where he observed the mock-up.

XML General Officer Executive Review - 15 September 1977. The Project hosted a program review for seven General Officers representing six DARCOM commodity commands and TRADOC's Logistics Center. During the review, the commanders were briefed on program status, to include Integrated Logistic Support Planning, plus they had an opportunity to see the mock-up at Chrysler.

Mr. Stephen Tolliver, Office of Management and Budget - 21 September 1977. Mr. Tolliver received a program briefing which covered in detail XML operational characteristics, standardization activities, 105mm/120mm Gun Evaluation, DT/OT Test Program and Leopard 2 AV Testing, facilitization and production planning, and RDT&E/PEMA Programs.

American Defense Preparedness Association, Aberdeen Proving Ground, Maryland - 29 September 1977. The Project Manager addressed the Association on managing the testing of a complex weapons system.

Management Procedures

International Responsibilities

(U) The International Operations Division, with principal staff responsibility for all international matters affecting the XML program, monitored the Leopard 2 AV DT/OT I Tests and actively pursued XML/Leopard 2 standardization efforts stipulated by Addendum 1 to the 1974 Harmonization MOU signed in July 1976. Also, the International Operations Division closely monitored the activities of the Leopard 2 AV Subsystem Cost and Technical Evaluation Board established as a result of the Addition to Addendum 1 signed by the US and Germany in January 1977.

(U) Toward the end of 1976 the governments of the United Kingdom and The Netherlands expressed an interest in co-production of the XML tank. As a consequence, there has been an extensive exchange of information. The office also continues to pursue standardization efforts between the US and Germany based on the recommendation of the Leopard 2 Subsystem Cost and Technical Evaluation Group.

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Tank Main Armament Development (TMAD) Division

(U) During the year, the responsibilities of the TMAD Division, Picatinny Arsenal, New Jersey, were increased. On 1 February 1977, with the formal reorganization of ARMCOM into two new commands, ARRADCOM and ARRCOM, the Assistant Project Manager (TMAD) became responsible for initial production of assigned systems in addition to their development.

(U) The Project Manager was assigned on 2 June 1977 the additional mission of negotiating a license with the Independent European Program Group (IEPG) for production of the US M735 Cartridge for IEPG defense use. This authority to negotiate was delegated to the Assistant Project Manager (TMAD). On 28 June 1977, the APM (TMAD) was appointed Deputy Chairman of the DA Tank Main Armament Evaluation Working Group with responsibility for the day-to-day management of the evaluation program.

(U) Succeeding Brigadier General Philip L. Bolte, on 28 March 1977, LTC David A. Appling was designated Assistant Project Manager. The APM had full line authority for international and national main armament development activities, operating under charter issued by the Project Manager.

Management Control System

(U) In June 1977, the XMI Schedule Control System was terminated. This system had been a useful management tool for identifying program areas which required special attention. The major shortcoming of the Schedule Control System was that it failed to identify the interdependency between various PMO activities. An effort was initiated in June to develop an automated Program Evaluation Review Technique (PERT) Time based Management Information System (MIS). This was a team effort composed of PMO representatives, as well as TARADCOM Systems and Cost Analysis Office analysts. One Harbridge House Inc. consultant, Mr. Walter H. Phoenix, also participated in the development effort. In order to prove the usefulness of the system, the Logistics Management Division was selected as a test bed. If the test was successful, the system would be expanded to cover the entire XMI PMO.

(U) In July, the Plans, Schedules and Studies Branch developed an interim management control system which will be used until the PERT MIS is operational. This system tracks milestones, and because it is contained in a looseleaf booklet, it was commonly referred to as the XMI Official Schedule Book. In September, it was decided to go ahead with further development of the automated PERT/Time MIS.

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System Status

Reliability, Availability and Maintainability (RAM)

(U) Reliability Failure Criteria. The "Draft Reliability Failure Criteria for the XM1 Tank-Revision B" was published and delivered to the XM1 PMO on 20 May 1977. These criteria updated the previous criteria (20 February 1975) by encompassing design changes resulting from the evaluation of both contractor and Government (DT/OT I) vehicle test programs, change in the XM1 Materiel Need Document and comments from the January 1977 informal Scoring Conference. These criteria reflected the XM1 design presented at the March 1977 Preliminary Design Review (PDR) including ten approved "user changes."

(U) After appropriate staffing at OTEA, TRADOC, LEA, AMSAA, TECOM, TARADCOM, LOG Center (TRADOC), Armor and Ordnance Centers (TRADOC), "Reliability Failure Criteria for XM1 Tank-Revision C" became Annex H to the official XM1 Coordinated Test Program on 26 September 1977.

(U) Improved Data Collection System for XM1 DT/OT II. The need for an improved data collection system to support RAM-D, Logistics and Operational and Support Cost considerations was recognized by the XM1 PMO. The current TECOM reporting system made available Equipment Failure Reports (EFR) and Maintenance and Parts Analysis charts which basically provided information for RAM-D analysis. However, with the advent of the Logistic Support Analysis Record System (LSAR), the Logistic predictions reflected in this documentation had by necessity been subsequently verified or revised. The current RAM data collection system did not provide the necessary LSAR data nor did it address information to identify operational and support costs.

(U) In concert with the Fighting Vehicle System's PMO, data needed to fully address our requirements were identified. DARCOM Headquarters identified TECOM as the DARCOM tester for assuring that the required XM1/FVS data were collected accurately. The TECOM system, identified as the Logistics Data Storage and Retrieval System (LOGSTAR), will be used to obtain development RAM and Logistics Data. This system was a computer data processing system with the following features: Dedicated data collectors, quality control checks on data, computer data file, and standardized output formats.

(U) Since this data system was targeted for implementation at the start of DT II testing in March 1978, a check out of the system was planned using the contractor engineering design test activity programmed to occur at APG during October and November 1977.

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(U) Other RAM Activities. This office participated in a five week evaluation board effort to assess the performance of the Leopard 2 (AV) German tank as tested at APG during September-December 1976. Particular emphasis was placed on ascertaining the feasibility and impact of standardizing on selected components and subsystems between the XM1 tank and the Leopard.

(U) The PMO staff presented a paper in August 1977 on the XM1 Reliability Growth Management Curve. This paper presented the philosophy and rationale used by the XM1 PMO in the development of the XM1 Tank System reliability growth curve and the use of the curve. Problems uncovered and lessons learned regarding the development of reliability management growth curves were reported. The paper was presented at the US Air Force Academy to the Reliability Working Group of the Technical Cooperation Program (TTCP). TTCP members included Australia, New Zealand, Canada, United Kingdom, and the USA.

United States/Germany Standardization Activities

(U) The XM1 technical efforts/accomplishments in achieving NATO Standardization/Interoperability are discussed below:

(U) XM1 Interoperable Improvements. In July 1976 an Addendum 1 to the basic US and Germany (GE) Memorandum of Understanding (MOU) was signed. This Addendum called for maximum practical commonality among the following components of both nations' tanks: Gun/Ammunition, Turbine/Transmission, Track/Suspension, Fire Control, Metric Fasteners, Night Vision Device, Gunner's Auxiliary Telescope, Hull and Metal Parts, and Fuel.

(U) During February-March 1977 the Leopard 2 Cost and Technical Evaluation Board conducted a comprehensive evaluation of subsystems with emphasis on MOU Addendum items, identified other potential areas of subsystem harmonization, and prepared an evaluation report to include a formal subsystem standardization plan.

Status of Progress on Addendum 1 Items

(U) Gun/Ammo. During the fall 1977, US Tank Main Armament Evaluation was scheduled to be conducted to obtain, analyze, and present data to support a US Tank Main Armament decision in December 1977. Candidates to be evaluated were the US 105mm M68 cannon, firing improved ammunition, the GE 120mm smoothbore system, and the UK M13A 120mm rifled system. The evaluation will be based on the test procedures, data requirements, assessment procedures, and baseline estimates used during the GE/UK/US Trilateral Tank Main Armament Evaluation. Major issues to be addressed included the question as to whether or not

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there was a requirement to replace the 105mm gun, if so, the urgency of the requirement. Also, the extent to which each of the candidate systems met the specified US requirement for such a system, and which of the candidate 120mm weapons represented the best alternative for US development and/or adoption. Another issue was the potential impact on schedules, producibility and costs.

(U) Turbine/Transmission. The United States provided, on 8 July 1977, to Germany a serviceable power package free of charge for installation and test in Leopard 2. Based upon Assistant Secretary of Army (RDA) guidance the US provided six adaptation components/control boxes free of charge and was to make available all common and unique spare parts. Germany will pay for integration of the power pack in the Leopard 2 tank, technical support, spare parts consumed, and most transportation costs. Control boxes were shipped from Chrysler in early September 1977 to support the German installation program which began in mid-September 1977. Necessary repair parts as agreed on to support the German test were anticipated to be available in early December 1977 for arrival on site for start of the German test in mid-December 1977. Chrysler technical support will be on site starting with German installation of the turbine through completion of the German testing in April 1978.

(U) Track/Suspension. US and Germany have agreed on certain common track dimensions; e.g., width of track, maximum height of track, center guide configuration compatible with Leopard 2 track, and sprocket to hub interface to conform to Leopard. US/GE, however, are unable to agree on track pitch, pin diameter, and end connector configuration. The US/GE Executive Group directed the Working Group to compare tracks with the goal of interchangeability in mind. This requires that both nations conduct necessary studies and tests to assess the impact of interoperability on each nations' tank programs. TARADCOM will be tasked to conduct detailed studies and to conduct tests of various track dimensions (pitch, pads, pin diameter, end connectors, sprockets, etc.). This is to determine, within the framework of commonality among XM1/M60, Leopard 2, and possibly others, the interoperability of equally dimensioned tracks and the problems associated therewith (vibration, life, weight, performance, etc.).

(U) Fire Control. The US/GE Executive Group directed the Working Group to compare fire control systems with the goal to achieve common controls and displays and to present a list of common components. Germany briefed the US at the September 1977 meeting on their recently selected Hughes fire control and installation in Leopard 2. Common components that were discussed at this meeting were the driver's night sight, main gun emergency firing device, and crew

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interoperability devices and techniques as recommended in the Leopard 2 Cost and Technical Evaluation Board study.

(U) Metric Fasteners. The goal is for both countries to use standard metric fasteners at unit level with only one set of tools on both tanks. Both nations employ metric fasteners; however, the two metric systems that are employed differ. As a result, of the six metric tools employed for crew level maintenance tasks, only two are common between the two vehicles. A hoped for international agreement of consolidation of screw head sizes that would have resulted in additional commonality was not forthcoming, therefore, consideration must be given by the Working Group to the proposal that both vehicles additionally carry each other's peculiar tools. Further discussions on this matter will be conducted early next year.

(U) Night Vision Device. Standardization is assured at the gunner's and commander's station since both the US and German devices use common modules packaged to each nation's basic vehicle design parameters. The Work Group recommended that the thrust of standardization for this item be expanded to include the driver's and loader's stations.

(U) Gunner's Auxiliary Telescope. Standardization of this item was impractical since the envelope which the telescope must fit was different and unique to the basic design of each nation's tank. The thrust of standardization should be one of crew interoperability with common controls.

(U) Hull and Metal Parts. Common technology; e.g., machining processes, and assembly already existed; and US and Germany agreed that designs were to remain separate.

(U) Fuel. Standardization was assured. DF 2 will be common fuel used by both nations' tanks.

(U) Non-MOU Items Recommended for German Consideration. In addition to the above MOU Addendum items the Leopard 2 Cost and Technical Evaluation Board recommended for Germany's consideration, the following 14 additional NON-MOU items: Turbine Power Pack Ancillary Equipment, Driver's Night Vision Device, Main Gun Emergency Firing Device, 7.63mm Machine Gun, Fire Extinguisher System, Crew Interoperability Devices and Techniques, Battery Mounting and Cables, Test Measurement and Diagnostic Equipment, Training Equipment, Personnel Heater, Bull Dozer Kit, Camouflage Netting and Pattern Painting, CBR Detection and Decontamination Equipment, and Radios.

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Technical and Testing Activities

Mobility (Turbine Maturity Program)

(U) During source selection it was noted that the engine test mileage was less than desired for either the AVCR 1360-2 Diesel or the AGT 1500C Turbine engine. The DA and DOD Engine Review Committees concluded that additional development work was necessary on either engine from the appropriate contractor to insure maturity prior to initial production.

(U) This past spring (1977), the turbine maturity program was negotiated with Chrysler. The program included four new engines and transmissions, six engine rebuilds, an additional facility vehicle, an increase in engine lab test hours from 4210 to 8530, and an increase in the facility vehicle durability test mileage from 4,000 to 42,000. Track testing, test support and an additional 6000 miles of transmission testing were also included in the program. Total program cost is approximately \$30.2 million.

(U) The maturity program schedules over 1,000 hours of lab testing before the start of DT/OT II. Additionally, two validation phase engines were scheduled to accumulate 9000 miles each in the automotive test rig in 1977 (one accumulated 9000 miles, the other 3821 miles prior to test termination for a scheduled vehicle rebuilt). Without the maturity program, the highest mileage on any engine would have been 6000 miles. With the program, one validation phase engine achieved 9000 miles and three FSED engines were scheduled for 9000 miles of durability testing in facility vehicles. Laboratory NATO cycle, low cycle fatigue and mission profile testing was more than doubled and development testing was greatly increased. Breakout of testing follows:

Vehicle Engine Durability and Reliability Testing

| | <u>FSED Basic Program</u> | <u>Maturity Program</u> | <u>Total</u> |
|---------------------------------|---------------------------|-------------------------|----------------|
| | <u>(Miles)</u> | <u>(Miles)</u> | <u>(Miles)</u> |
| Durability (FV1, FV2, FV3) | 4,000 | 29,000 | 33,000 |
| Reliability/Durability (FV4) | ---- | 9,000 | 9,000 |
| DT/OT II (FSED Pilots) | 55,700 | ---- | 55,700 |
| | <u>59,700</u> | <u>38,000</u> | <u>97,700</u> |

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Engine Lab Testing Program

| | <u>Basic Program (Hours)</u> | <u>Maturity Program (Hours)</u> | <u>Total (Hours)</u> |
|---|----------------------------------|-------------------------------------|--------------------------|
| Design Evaluation/Pre Low Cycle Fatigue Test | 800 | 300 | 1100 |
| Electronic Fuel Management System | 100 | 1400 | 1500 |
| DF2 Fuel System | 915 | 435 | 1350 |
| Pre NATO/Abrasive Tests | 425 | 305 | 730 |
| Reliability/Mission Profile | 900 | 300 | 1200 |
| Low Cycle Fatigue Tests | 600 | 600 | 1200 |
| NATO Cycle Endurance Tests | <u>470*</u> 4210 | <u>980**</u> 4230 | <u>1450</u> 8530 |

*One 400 hour NATO test.

**Two 400 hour NATO tests.

The above testing should provide a great degree of confidence in engine maturity prior to initial production.

Weapons System

(U) The selection of a main weapon system was contingent upon the main weapon decision for the XM1 Tank System which was scheduled for 30 December 1977 (with Congressional consideration to follow during February 1978). Firing of the candidate 120mm weapon system (UK and FRG) and the US 105mm system was scheduled during November-December 1977, along with a concurrent US evaluation of all of the competing weapon systems.

(U) FSED pilots and early production vehicles will incorporate the US 105mm M68 cannon. A 120mm weapon if selected will likely be phased into production in early 1983.

(U) The Bushmaster weapon was replaced by the M240, 7.62mm machine gun as the coaxial weapon in the XM1 Tank System, and the commander's station mounts the M2, caliber .50 machine gun. Also, the mount was to accommodate the M240 machine gun, and the M240, 7.62mm machine gun was to be mounted external to the tank at the loader's position. Designated as a requirement for the tank was the UK Smoke system (USXM239).

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Armor

(U) Armor Ballistic Structure Test Program. The contractor successfully completed the planned armor ballistic structure test program. Tests verified the correction of deficiencies and weaknesses identified during the DT/OT I testing and proved out the improvements in protection levels achieved with the FSED design. Design and fabrication of the ballistic hull and turret is underway with testing scheduled to begin in March 1978. Programs continued at BRL to expand the data base on defeat of existing and postulated threat munitions. Vulnerability studies of the XM1 with both 105mm and 120mm weapons were initiated to assist in evaluating the survivability of the XM1.

(U) Ammunition Compartmentalization Development Program. The contractor continued to progress with their efforts on the design, test and evaluation of ammunition compartments. Significant improvements in performance of their compartments was accomplished by the contractor in the last six months. BRL conducted investigations and developed additional baseline data in order to furnish design guidelines to the contractor.

Electromagnetic Compatibility/Electromagnetic Interference (EMC/EMI)

(U) During the validation phase, the contractor designed components and systems to meet the electromagnetic compatibility requirements and conducted tests to assure intra-system compatibility. Government testing will be conducted during Full-Scale Engineering Development (FSED).

Nuclear Effects

(U) Electrical igniters and shells for the 105mm ammunitions were examined for possible ignition and detonation when subjected to specific electromagnetic pulse. This analysis indicated that there are adequate margins against firing by the specified electromagnetic pulse event.

(U) The radio set AN/VRC-12 was evaluated for the effects of nuclear radiation and the final report was written. The tests indicated that the radio set AN/VRC-12 was inherently hard to nuclear effects.

(U) A nuclear hardness study was conducted for the night vision FIR thermal modules as integrated in the M60 Tank Thermal Sight (TTS). Only modules will be utilized for the XM1 night vision requirement. The study indicated that the modules were inherently hard to nuclear effects.

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(U) Transient radiation effects (TREE) tests were being conducted at the piece part and circuit levels for those components and circuits when no data base existed. These tests were being utilized to resolve marginal situations and establish the required approved parts list.

(U) A series of system level EMP tests were performed to verify the coupling analysis and protection requirements on PV-31 (Validation vehicle). These test results were being utilized to extend the analytical models where required.

Preliminary Design Review (PDR)

(U) A Preliminary Design Review (PDR) was conducted 28 March through 1 April 1977 at Chrysler Sterling Defense Division. The meeting was co-chaired by the government XML Project Management Office and top management Chrysler personnel.

(U) A total of 62 action items were identified at the PDR. All of the action items were either reported as resolved or where further follow-on actions (testing, etc.) were required, dates were established for final resolution.

(U) A "close-out" meeting was conducted on 27 April 1977 to review the PDR action items and assess the close-out resolution. The review was considered to be very satisfactory.

Testing Summary

(U) Leopard 2AV Testing. DT/OT I Leo 2AV testing began on 7 September 1976 at APG and was completed 17 December 1976. Development Test (DT) I testing: ballistic hull and turret, 3000 mile durability, and weapons system firing were completed. Operational Test (OT) I testing began on 1 December and was completed on 15 December 1976. A total of 2174 rounds were fired during DT I by the pilot vehicle and 14 hit probability conditions were completed with and without a muzzle reference system. TECOM test reports on DT I Leo 2AV Automotive and Weapons System Phases were received in January 1977 and the Vulnerability report in February 1977. OTEA OT I Leo 2 AV test report draft was published in January 1977.

(U) Leo 2 AV 120mm weapons testing was conducted 14-26 February 1977 at APG. Tests included non-firing, tracking, laying stability, and Hardison testing. Live firing for hit probability was conducted for four conditions using KE and HEAT rounds. Only 36 rounds were fired in the hit probability phase due to the limited availability of experimental rounds.

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(U) The Leopard 2AV tank proved to be a quantum improvement over the Leopard 2. Therefore, the FRG decided to produce the Leo 2 AV for the German Forces; the "AV" was deleted from the name, and the 120mm smoothbore gun added. Although the Leopard 2 AV tank represented a significant improvement over currently fielded NATO tanks, it did not meet major US tank requirements, especially in the area of survivability. The XM1 proved to be a superior, less costly tank.

(U) XM1 Testing. During the period 1 October 1976 to 12 November 1976 the Chrysler XM1 prototype vehicle and the General Motors XM1 automotive test rig underwent automotive tests at Yuma Proving Grounds (YPG). On 12 November 1976 the FSED contract was awarded to Chrysler Corporation and testing continued from 29 November 1976 through 11 December 1976 at YPG on the Chrysler prototype. YPG Report No. 310 dated February 1977 gave the results of this testing.

(U) Prototype Vehicle (PV-31). The Chrysler prototype vehicle (PV-31) was shipped in January 1977 from Yuma Proving Ground to Aberdeen Proving Ground (APG) for continued engineering tests of the fire control system. PV-31 completed its intended development firing test program at APG on 14 May 1977. Tests were conducted to evaluate handle shaping, electrical gains, lead filtering, wind sensor, and muzzle reference sensor. A total of 924 rounds were fired since the beginning of FSED. PV-31 was shipped to Woodbridge, Virginia, for Electro Magnetic Pulse testing which was completed on 15 June 1977, then returned to the Detroit Tank Plant for installation of the FSED fire control system.

(U) Automotive Test Rig (ATR-31). Throughout this same time frame the XM1 Automotive Test Rig (ATR-31) underwent automotive testing for the turbine durability and track development. ATR-31 was used in an extended durability test program with the objective of accumulating 9000 test miles on each of two engines (S/N 32 and 26). Engine S/N 32 completed the 3000 additional miles required to reach the 9000 mile goal. A total of 3329 miles was accumulated on engine S/N 26 to give a total of 3822 prior to a scheduled rebuild of ATR-31.

(U) Ballistic Hull and Turret. Ballistic testing of hull structure H-2 to check the FSED hull armor design was successfully completed with results indicating materiel need requirements met. Firing tests of the secondary weapons in the coax, loaders, and commanders weapons stations have also been performed to verify installations and feed mechanisms. The Gun Mount Test, Phase I of a combined gun mount, thermal shroud, muzzle reference, and trunnion bearing test was completed on 26 July 1977.

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(U) Testing of Refurbished Vehicle. Refurbishment of PV-31, which was relabeled FV-2, was completed in September 1977. The refurbished vehicle was shipped on 19 September 1977 to APG to begin Engineering Development Test - Contractor (EDT-C). EDT-C testing completed during September 1977 included an Electromagnetic Compatibility (EMC) test, exterior ballistics and FSED fire control computer integration check. On 30 September 1977, 145 main gun rounds had been expended in this test. Scheduled completion date for the test is 12 November 1977.

International Programs

Leopard 2 Systems Status

(U) Leopard 2 Pilot 19, the automotive test rig as well as the ballistic hull and turret, completed DT and OT tests at Aberdeen Proving Ground in December 1976. All three systems less the Pilot 19 turret were shipped back to Germany. Pilot 19 turret was placed on the Pilot 7 chassis and the 106mm LFA3 gun was replaced with the German 120mm SB version. During February of 1977 firings were conducted with the 120mm gun installed in Pilot 19 turret. The turret was then returned to Germany and the last of the German observers went back at that time.

(U) In January of 1977 an addition to the Harmonization MOU Addendum, July 1976, was signed between the United States and Germany postponing the US tank main armament selection to December 1977. Furthermore, both countries agreed that the evaluation of Leopard 2 AV would be restricted to subsystems only. As a consequence, the DCSRDA established a Leopard 2 Subsystem Cost and Technical Evaluation Board under Major General Otis which presented a report in April 1977 recommending 14 additional items for standardization. Germany considered this to be strictly a US unilateral effort but responded to Volume IV of the report listing the 14 items.

Leopard 2 Cost and Producibility Study

(U) In December of 1976 the FMC Corporation completed the Leopard 2 cost and producibility study. While the study found that the Leopard 2 was producible in the US, it could be built only at a cost significantly higher than the XM1.

Standardization

(U) In accordance with the Harmonization MOU as well as Addendum 1, the US and Germany actively pursued standardization of XM1 and Leopard 2 components, such as, track, metric fasteners, and fire

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control. Both the Executive and Working Groups continued to pursue these standardization efforts to include several of the 14 additional standardization items identified by the Leopard Cost and Technical Evaluation Board.

(U) In July of 1977 the US delivered a validation turbine engine to Germany for installation into a Leopard 2 chassis for statis and diagnostic testing. Technical representatives were on site to observe the installation and testing of the turbine power pack. The tests were expected to be completed in June of 1978.

Co-Production

(U) In December of 1976 and February 1977 respectively, the governments of the UK and The Netherlands expressed an interest in co-production of the XM1 tank. Both governments received briefings and other detailed information on the XM1 tank under the auspices of the DARCOM Memorandum issued 6 February 1975. A number of delegations from the United Kingdom and the Kingdom of The Netherlands visited PMO XM1; more visits were expected to follow.

(U) The United Kingdom was expected to make a decision concerning a follow-on tank to the Chieftain in April-June of 1978. That tank was scheduled to be retired in the 1987-89 time frame.

(U) The Netherlands was expected to make a decision in 1979 concerning a follow-on tank to the Centurion which was scheduled to be replaced in the early 1980's.

Tank Main Armament System Development and Production

Tank Main Armament Evaluation

(U) During November-December 1976 limited firing trials of the British and German 120mm tank armament systems against special armor targets were conducted at Aberdeen Proving Ground.⁵ For comparison purposes, the test program included 105mm XM774 cartridges. The results, while useful, did not support a specific selection decision. During the same period, the performance requirements which a 120mm system would have to meet if adopted by the US were definitized and approved by HQDA.

⁵US AMSAA Interim Note No. G-37, Limited Effectiveness Assessment of the FRG/UK/US Firing Trials (U), 1 Jan 77.

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(U) On 12 January 1977, the US and German representatives signed an addition to Addendum 1 of the MOU between the two countries concerning harmonization of the XM1 and the Leopard 2, whereby the selection decision date of 15 January 1977 was deferred to not later than 30 December 1977.

(U) The Tank Main Armament Evaluation Working Group (TMAEWG) was informally established in January 1977 to manage the continued evaluation and address the following specific issues:

- a. Whether or not there was a requirement to replace the 105mm gun and, if so, the urgency of the requirement.
- b. The extent to which each of the candidate systems met the specified US requirement for such a system.
- c. Which of the 120mm weapons represented the best alternative for US development and/or adoption.

(U) The TMAEWG was confirmed and made an official DA working group on 14 June 1977.

(U) Between January and September 1977, the TMAEWG planned a comprehensive evaluation consisting of studies (design, standardization, licensing, cost, producibility, logistics, etc.), on-site observation, analytical evaluation, and US firing trials. Intensive on-site observation in Germany and the United Kingdom was initiated in July 1977, and the storage phase of tropic testing in Panama began in September 1977. The final report of evaluation was due in December 1977.

Ammunition Production (Cartridge, 105mm APFSDS-T, M735)

(U) Following type classification standard of the M735 Cartridge in September 1976, the FY 1977 procurement quantity of 107,000 was released to ARMCOM for accomplishment under the overall management of the XM1 Project Manager. The responsibility for accomplishment passed to ARRADCOM in February 1977.

(U) In the March-April 1977 time frame, OSD and DA interest in cost reduction and eliminating use of critical materials increased the visibility of efforts to evaluate depleted uranium (DU) as a potential replacement for tungsten for the projectile core. Additional tests of XM735E2 Cartridges during August 1977 provided additional data relative to performance against the NATO Heavy Triple target and the special In-Process Review (IPR) called for by the development acceptance IPR in September 1976 was scheduled for October 1977.

(U) In November-December 1976, and March 1977 XM735E2 Cartridges were test fired by Germany at Meppen Proving Ground. Similar tests were conducted by France using their F1 Gun at Bourges in February and September 1977. Successful results supported continuing interest by the Independent European Production Group (IEPG) in a license for the M735.

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Ammunition Development (Cartridge, 105mm, APFSDS-T, XM774).

(U) The XM774 entered validation in October 1976. In November 1976, acceleration of the XM774 program was requested as a result of OSD interest in cost reduction and the improved performance expected.⁶ In April 1977, increased funding was provided to expand the producibility engineering phase. Development Test I testing started in July 1977 and was completed successfully in September 1977. An In-Process Review to support entry into Full Scale Engineering Development (FSED) was scheduled for October 1977.

Ammunition Development (Cartridge, 105mm TPDS-T, XM797).

(U) Staffing of a proposed Letter of Agreement (LOA) for a 105mm Target Practice TPFSDS-T round to match the M735/XM774 to 3,000-4,000 meters and have a maximum range no greater than 6,000-8,000 meters was continued through FY 1977 and signature was imminent at year's end. The designation has been revised to TPDS-T to allow consideration of, among other candidates, a spin-stabilized tubular projectile (STUP) concept sponsored by the Canadians.

(U) Funding guidance for FY 1978 was confirmed in July 1977, and an In-Process Review to support entry into validation was scheduled for November 1977.

Ammunition Development (Cartridge, 105mm, HEAT-MP-T, XM815).

(U) Coordination of the Letter of Agreement (LOA) was completed and the LOA was approved in July 1977, but no funding was received. An IPR was scheduled for November 1977 to support entry into validation contingent upon receipt of funding.

Ammunition Development (Cartridge, 105mm, APFSDS-T, XM814).

(U) This tungsten-core alternative to the XM774, formerly part of the XM774 program, was formally separated therefrom and redesignated XM814 in June 1977. At fiscal year's end, it was not supported by either a requirements document or funding, and its outcome was dependent upon negotiations with the United Kingdom and possibly France on co-development of improved 105mm main armament.

⁶DAMA-CSM Msg 242019Z Nov 76, Subj: Tank Gun Developmental Ammunition.

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Logistics

(U) During this reporting period new Logistics Plans were developed, printed, and distributed in conjunction with the XML Development Plan. Numerous interface meetings were held with commodity commands and logistics activities.

(U) The significant logistics activities during this period included a work meeting between the prime contractor (Chrysler) and XML PMO logistics key personnel during November 1976. The purpose was to establish rapport with contractor personnel and definitize contractual work statements so that the program objectives would be met during the FSED phase.

(U) The XML Integrated Logistic Support team was briefed on the logistic contents of the FSED contract. A change in the maintenance evaluation planning was recommended by the DARCOM representative.

(U) Approximately 125 students took the Staff Planners Course during the period of April-May 1977. They were briefed on the XML program schedule and technical features of the XML tank.

(U) Numerous budgeting exercises were conducted to establish initial provisioning funding requirements for different XML production schedules.

(U) To satisfy the FRG/US standardization memorandum of understanding, the metric fastener requirements for crew level maintenance were identified.

(U) Training Device requirements for the XML tank were being reviewed by DA pending final approval. These devices were: a loader trainer, conduct of fire trainer, tank driver trainer, and turret maintenance trainer/simulator.

(U) The new look in publications, Integrated Technical Documentation and Training (ITDT), was being implemented for the XML maintenance publications. Numerous in-process reviews by publication specialists from TRADOC, DARCOM, and Commodity Commands were made to assure that an optimum manual was published.

(U) A PERT network for the XML Integrated Logistic Support (ILS) activities was established. The network identified all key milestone activities and highlighted those activities associated with the ILS critical path.

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(U) An XML/Commodity Command provisioning data meeting was held to identify Commodity Command requirements to be obtained from the contractor to support cataloging efforts.

(U) A review of the contractor's test equipment development program indicated that a Simplified Test Equipment/Internal Combustion Engine (STE/ICE) parallel development program can possibly result in eliminating the contractor developed engine organizational and vehicle electrical system test sets. Action was taken to establish a STE/ICE study program.

(U) A User Maintainability Design review of the XML tank mock-up was held in August 1977. Attendees included noncommissioned officers and warrant officers from DARCOM, ARRCOM, FORSCOM, TRADOC and USAREUR to obtain direct input of maintenance personnel with extensive Army Field experience. Twenty-eight items were selected for detailed evaluation.

(U) Redirection of the FSED Maintenance Evaluation was made by scheduling of a Physical Teardown/Maintenance Evaluation (PT/ME) of FSED Pilot Vehicle #1 and the contractor prepared a PT/ME plan. At the conclusion of the fiscal year, efforts to modify the FSED contract for contractor performance of the PT/ME were on-going.

(U) The LOGCAP for the XML tank was presented to the DCG for Materiel Readiness, DARCOM, on 14 April 1977. The LOGCAP included the XML program schedule, each element of Integrated Logistics Support (ILS) planning and a program summary. The Deputy Commanding General for Materiel Readiness (DCGMR) gave guidance through the Project Manager addressing problem areas surfaced during the LOGCAP.

Procurement and Production

Contracts

(U) On 12 November 1976, the Secretary of the Army announced that Chrysler Corporation had been selected over General Motors Corporation as the contractor for the Full Scale Engineering Development/Producibility Engineering and Planning (FSED/PEP) and subsequent Low Rate Initial Production (LRIP) phases of the XML program. The FSED/PEP was awarded to Chrysler in the amount of \$196,405,530. This contract was unique in that it provided for "not to exceed ceiling prices" for the LRIP quantity of 110 vehicles, and the second year production of a quantity of 352 tanks.

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(U) The FMC Corporation completed the FRG Leopard 2 (AV) Cost/Producibility Study on schedule (December 1976) and within the negotiated contract dollar constraints. An on-site review of the final report was made, and its validity was accepted by both the US Army and the FRG.

(U) FMC announced its decision in December 1976 that it did not intend to respond to the Request for Proposal for a Full Scale Engineering Development/Producibility Engineering and Planning program for the Leopard 2 (AV) vehicle. A Leopard 2 Subsystem Cost and Evaluation Board was convened from 14 February 1977 through 30 March 1977. No additional significant final selection decisions were made by the two countries during the reporting period, but there remained an on-going standardization effort through such media as US/FRG working group meetings and higher management executive sessions.

(U) The amount of the FSED/PEP contract increased to \$226,773,323 through 30 September 1977. At a cost of \$30,196,124, the major increase was the incorporation of an extended engine development program at the direction of the Secretary of the Army. Performance of the overall contract was on schedule, and delivery of the first pilot vehicle was expected in February 1978.

(U) Chrysler was awarded a contract in August 1977 to perform a concept/design/review and evaluation for the determination of the impact and manner of incorporating a new tank armament weapon system into the XM1 tank in place of M68 105mm weapon system. Candidate systems to be evaluated were the standard US 105mm weapon system (plus XM774 cartridge), FRG 120mm weapon system, and the UK 120mm (M13a) weapon system. The data thus generated was to be available for use in the main gun decision scheduled for December 1977. This was a three month contract effort in the amount of \$196,000.

(U) In January 1977, a contract was issued to Chrysler for the purpose of providing the Government and its Architectural/Engineering Contractor information peculiar to Chrysler's plans for utilization of the Lima Army Modification Center in production of XM1 Tank Systems, and to develop technical and cost data required to assist in the XM1 production planning. This contract was only for a four month effort to bridge the gap prior to entering into a full-fledged Production Planning/Manufacturing Engineering contractual agreement. The amount of this contract was \$1,910,712.

(U) Subsequent thereto, two letter contracts were awarded to Chrysler on 29 April 1977. One provided for the Production Planning/Manufacturing Engineering effort to assure a smooth transition from FSED/PEP to production of the XM1 Tank System at the site selected for

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such production--the Lima Army Modification Center (LAMC). The other was a facilities contract for the facilitization of LAMC and supporting satellites to the degree required to develop the capability to produce a total quantity of 3,312 XML tanks at a production rate of 30 units per month, plus spare parts, with a surge capacity of 75 vehicles per month, plus spare parts. This was to be premised on 30 units on a 1-8-5 shift basis and 75 units on a 3-8-5 basis. Spare parts requirements were to be constructed to represent 15 percent of the quantity of components and parts delivery for installation in the vehicles.

(U) The facilitization letter contract was definitized in July 1977 in the amount of \$226,729,640, and through 30 September 1977, the contract was funded in the amount of \$21,700,000. However, the stringent requirements placed upon Chrysler and the major subcontractors to fully justify the acquisition of new equipment has resulted in approval of expenditure of only \$10,443,493 through FY 1977.

(U) The Production Planning/Manufacturing Engineering contract was subsequently modified (in August 1977) directing Chrysler to plan to facilitize LAMC, Detroit Army Tank Plant, and support facilities to produce the XML Tank System at a rate of 60 vehicles per month, on a 1-8-5 shift basis, with a surge capacity of 150 vehicles per month, on a 3-8-5 basis. These capacity conditions did not include any allowance for production of spare and repair parts. Under this concept, it was contemplated that spare and repair parts were to be produced on alternate shift bases. This change in monthly production rates and capacity was predicated on the ASARC decision to increase the total XML buy to 7,058 tanks, with higher production rates. The facilities contract was correspondingly changed at the same time, and the impact of the change was to be proposed by Chrysler in December 1977.

(U) Chrysler submitted a proposal for definitization of the basic letter contract in the amount of \$263,000,000. This proposal did not include the amount for the increased capacity based on the ASARC decision. The proposed submission for this impact is targeted for December 1977. Negotiation for the definitization of the basic letter contract is on-going and progressing at a relatively slow pace.

Production Site

(U) On 9 August 1976, the Secretary of the Army announced that the Lima Army Modification Center (LAMC) would be utilized for early production of the XML tank. After M60 tank production was completed, the Detroit Army Tank Plant (DATP) would be combined in some manner, with the LAMC to meet the objective of 60 tanks per month on a single shift basis and 150 tanks per month at the surge or maximum shift capacity. In order to determine the most effective configuration for

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the LAMC and DATP, a study team was formed to examine the numerous possibilities for combining these plants. This study team was established under the chairmanship of LTC J. Evans, OPM XML. Government members of the study team included representatives of the OPM XML, OPM M60, Department of the Army Materiel Development and Readiness Command (DARCOM), the Tank-Automotive Materiel Readiness Command (TARCOM), and the Corps of Engineers (COE). In addition, prominent production experts from private industry served as consultants to this team. Chrysler Corporation was awarded a contract in January 1977 for the development of plans and cost estimates to support the various configurations. Various plans for mirror image, complimentary, and interdependent plant configurations were considered and their advantages and disadvantages weighed.

(U) The study team recommendations were provided to a Special Tank Task Force (STTF) which was reviewing the tank program under the staff supervision of DCSRDA. On 22 July 1977, the STTF presented these recommendations to an Army Systems Acquisition Review Council (ASARC) which recommended approval of the interdependent assembly plant configuration. These recommendations were in turn approved by the Vice Chief of Staff. Under this plan, LAMC would be initially facilitated to support complete manufacturing of hull and turret structures at a rate of 30 per month and assembly, test, and ship complete tanks at a rate of 30 tanks per month on a single shift basis. The Scranton Manufacturing Plant and the DATP would initially manufacture the "make" components to support a 30 per month assembly rate at LAMC. Later, when M60 production has been completed, the DATP and Scranton would increase their component manufacturing capacity to 60 per month on a single shift basis and the DATP would assemble, test and ship complete tanks at a rate of 30 per month. LAMC would increase its single shift capacity to manufacture hull and turret structures to 60 per month and would ship 30 hull and turret structures to DATP each month. The LAMC would also continue to assemble, test and ship completed tanks at a rate of 30 per month.

(U) The H. K. Ferguson Company, under contract to the Baltimore District Engineer Office, continued work on the design of the facilities at Lima for XML production. This effort included new construction, refurbishment of existing buildings, and other site work necessary to activate the LAMC. Foundations for a 250,000 square feet building addition were complete, and structural steel installation had begun. Renovation of ancillary buildings had started. Future work included new interior construction for the main manufacturing building, construction of a new test track and supporting structures, and renovation of the rail system.

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Production Planning

(U) A letter contract for the production planning and implementation phase was awarded in May 1977 and was planned to run for 36 months. Definitization is scheduled for early FY 1978. Under this contract, Chrysler will develop manning requirements for production; develop a production plan; perform make/buy analyses; develop manufacturing process methods and work standards; develop quality control programs; design and fabricate special tools and special test equipment; identify required industrial plant equipment; qualify production material, equipment, tools and test equipment; and establish plant layouts.

Facilitization Task Force

(U) Effective 12 September 1977, a Facilitization Task Force was established within the Office of the Project Manager, XML. The Task Force was responsible for the development and implementation of all facilitization planning in support of the XML Tank System to include: the management of a system approach for production facilitization control; management of contractor's production planning to include process and machine selection, make/buy structures, schedules and space requirements; verification of requirements for Corps of Engineers construction projects, development of the projects and management of the construction budget; management of Industrial Plant Equipment acquisition; and management of facilitization cost data.

Financial

Funds

(U) RDTE. The Full Scale Engineering Development (FSED) contract was awarded to Chrysler Corporation on 12 November 1976 in the amount of \$196.4 million. Subsequent contract modifications have increased this value by \$30.2 million for the Extended Turbine Durability program and \$1.2 million for user and other miscellaneous requirements.

(U) Congressional restriction on the use of \$23.0 million of FY 1977 RDTE funding was lifted when Chrysler Corporation was awarded the FSED contract. This amount coupled with \$105.4 million authorized for FY 1977 RDTE increased the value of funds available this year to \$128.4 million. By the conclusion of FY 1977, RDTE program authorization was reduced by \$6.7 million due to realignment of DARCOM in-house and other DA activities.

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(U) Army Procurement Appropriation (Weapons, Combat Tracked Vehicles). The FY 1977 program was authorized at \$65.2 million for Production Base Support (PBS) and \$35.6 million for Initial Production Facilities (IPF). Revised estimates resulted in an IPF reduction to \$21.2 million and the remaining \$14.4 million submitted as a reprogramming action to the PBS program. The reprogramming action was pending in the Congress at the close of the fiscal year. Funds in the amount of \$40.0 million (PBS) were obligated with the Baltimore District Corps of Engineers for the Lima Army Modification Center (LAMC) modernization/expansion project. Additional funds in the amount of \$21.7 million (PBS) were obligated with Chrysler Corporation for purchase of Industrial Plant Equipment (IPE) and \$2.7 million for other LAMC activities, also \$9.0 million (IPF) was obligated with Chrysler Corporation for production engineering/implementation and the balance was carried forward.

(U) The FY 1976 program of \$2.486 million remained obligated with the Baltimore District Corps of Engineers for architectural engineering and design effort associated with the LAMC project. There was no carryover to FY 1977.

(U) The FY 1975 program had approximately \$55 thousand carried over to FY 1979. Approximately \$36 thousand was returned to DARCOM and the remainder was obligated for consultant services associated with the LAMC project.

C/SCSC and the CPR

(U) The XML prime contractor and numerous subcontractors employed the Cost and Schedule Control System Criteria (C/SCSC) to manage the FSED phase of XML Tank System program starting in the 3d quarter of FY 1977. As a result of the use of C/SCSC, the total contract met with favorable cost conditions for FY 1977. The contractor was considered to be essentially on schedule. Through the efforts of the PMO and the contractors, a significant management reserve had been effectively established to fund unforeseen contingencies. Using current C/SCSC reports it was forecast that at the conclusion of the FSED phase, the overall contract will show a small cost underrun. Efficient use of management reserve should alleviate any currently unforeseen overall contract setbacks and thereby assure this cost underrun projection.

Evaluation of Contractor's Design-To-Cost Report

(U) Chrysler submitted the first detailed report as of 12 June 1977. A team conducted a government review and validated procedures and estimates for the prime contractor and major subcontractors. The

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next report was due June 1978 with an unscheduled review to be made December 1977-February 1978.

Life Cycle Cost (LCC) Study

(U) The LCC Study completed in FY 1976 was updated to reflect selection of Chrysler Corporation as the source contractor and published in support of development concept paper (DCP) 117A. The Source Selection Evaluation Board results served as a basis for much of the updated study. Chrysler was required to estimate life cycle costs during the current program phase and their first report was due October 1978. A management plan for this effort was presented to the PMO during September 1977 and details were being negotiated at this time.

Leopard 2 AV

(U) The Leopard 2 AV Cost and Producibility Study by FMC was completed in December 1976 and the final report was submitted. As was the case with XM1 contractors in the Design-To-Cost reports, the government conducted an in-depth review of the draft final report to ascertain its credibility. As a result, the government made numerous recommendations to FMC which were incorporated into the final report. The Leopard 2 AV projected hardware cost (including licensing of \$28 thousand was \$784 thousand (FY 1976 \$) as opposed to the XM1 unit hardware cost threshold of \$754 thousand (FY 1976 \$). With the completion of this effort, the XM1 PMO then had a realistic projection of the cost to produce the Leopard 2 AV in the United States. Such data allowed for meaningful cost comparisons.

BLACK HAWK

Utility Tactical Transport Aircraft System (UTTAS)

Introduction

(U) Colonel Richard D. Kenyon was designated Department of the Army Project Manager (PM) for the Utility Tactical Transport Aircraft System (UTTAS) effective 29 October 1976 by the Project Charter signed by the Honorable Martin R. Hoffman, Secretary of the Army, dated 18 January 1977. He succeeded MG Jerry B. Lauer who departed the Command in September 1976.

(U) The Utility Tactical Transport Aircraft System was redesignated BLACK HAWK on 7 September 1977 at a ceremony on the historic parade grounds at Fort Myer, Virginia. On 11 September 1977,

PO 88-1, 10 Nov 77.

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the BLACK HAWK Project Manager's Office had a reorganization. In order to meet the high grade reduction, imposed by DARCOM, the Project Support Division was eliminated and the major functions transferred to the Program Management Division. The Administrative function was assigned to Headquarters and the personnel transferred with the function. Also, the Product Assurance and Test Management Divisions were combined to assist with the high grade reduction.

Organization and Staffing

(U) The Project Charter, dated 18 January 1977, and approved by The Honorable Martin R. Hoffman, Secretary of the Army, designated Colonel Richard D. Kenyon Project Manager for the Utility Tactical Transport Aircraft System.

(U) At the beginning of Fiscal Year 1977, the personnel authorization was 84 (76 civilians and 8 military), and the TDA average grade was 10.2857. Military authorization was increased by one Warrant Officer and seven enlisted spaces.⁸ This increased the total authorization to 92 (76 civilians and 16 military).

(U) The onboard strength at the beginning of Fiscal Year 1977 was 83 (74 civilians and 9 military) and the average grade was 10.2432. At the end of the Fiscal Year, the strength was still 83 but the civilian-military mix had changed to 67 civilians and 16 military. The excessive civilian vacancies were due to the reorganization of AVSCOM into two separate Commands (AVRADCOM and TSARCOM), and also the result of the requirement to reduce high grades.

RDTE Funding

(U) As of 30 September 1977, the BLACK HAWK RDT&E Program was \$74,778,000. FY 1977 funding resources were stratified as indicated:

| <u>Funds</u> | <u>Project Number</u> | <u>Total Funding</u> |
|--------------|---|----------------------|
| RDT&E | BLACK HAWK (UTTAS) Engine 1X264206D3189 | \$ 5,000,000 |
| | BLACK HAWK (UTTAS) Producibility Engineering and Planning (PEP) 1X264206D378 | \$21,318,443 |
| | BLACK HAWK (UTTAS) Airframe 1X264206D378 | \$48,459,557 |

⁸TWX, DRCPT-SA, 291802Z Dec 76.

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(U) The original BLACK HAWK (UTTAS) Program was \$75.451 million. However, during FY 1977 the following transactions occurred: \$6.855 million was reprogrammed to cover PEP requirements; \$250 thousand was reprogrammed for Airframe Maturity; \$359 thousand was reprogrammed for Airframe Engineering Change Proposals (ECP), and \$192 thousand was reprogrammed for T700 Engine Cost Reduction Program.

(U) DARCOM withdrew \$5.5 thousand for issuance to PM Field Office through Military District Washington, DC. However, the \$5.5 thousand was returned to the program, 30 June 1977, and \$678 thousand was withdrawn by higher headquarters to fund a DIVADS requirement. The FY 1977 Program of \$74,778 was 76.8 percent obligated and 62.7 percent disbursed. Total Airframe Program was \$69.778 million of which \$52.397 million or 75.1 percent was obligated and 60 percent disbursed. The FY 1977 BLACK HAWK Engine Program of \$5.0 million is 100 percent obligated and disbursed.

APA Funding

(U) The FY 1977 Aircraft Procurement, Army (APA) funds totaled \$140,500,000. However, the BLACK HAWK (UTTAS) Project Manager's Office had full control of only 89.3 percent or \$125,500,000 of the allocated funds. Of the controllable funds, 91.4 percent were obligated as of the end of Fourth Quarter FY 1977. The program was stratified as indicated:

| <u>Funds</u> | <u>Budget Line Item</u> | |
|--------------|--|------------------|
| APA | Number 7 | |
| | CC 1100.68.7.01007 | |
| | (CA7) Airframe | \$82,072,756.00 |
| | (CB7) Engine | 29,826,947.00 |
| | (CC7) Avionics | 1,605,297.00 |
| | (CF7) GFE-Engine | 54,950.00 |
| APA | TOTAL BLI #7 | \$113,559,950.00 |
| APA | Number 8 | |
| | (CE7) Engine | \$ 5,019,266.00 |
| | (CD7) Avionics | 2,471,734.00 |
| | (CG7) BLACK HAWK (UTTAS) Training Equipment | 4,409,000.00 |
| | (CH7) BLACK HAWK (UTTAS) Airframes (GFM) | 40,050.00 |
| APA | TOTAL BLI #8 | \$11,940,050.00 |

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Implementation of Design-to-Cost Goals

(U) Original design-to-cost goal of \$600 thousand was established 11 July 1974 for the BLACK HAWK airframe only by Deputy Secretary of Defense Memorandum. This goal of \$600 thousand (FY 72 \$) was based on an average unit cost for 1107 units to be delivered at a rate of 14 per month and was included as a target cost in the development contracts. In order to comply with DOD Directive 5000.28, Design-to-Cost, it was necessary to redefine the BLACK HAWK DTC goal based on an average unit flyaway cost as follows:

Average Unit BLACK HAWK Flyaway Cost (Qty 1107, 14 Per Month, FY 72\$)

| <u>Recurring</u> | <u>DTC Goal</u> (in thousands) |
|--------------------------------------|-----------------------------------|
| Airframe | \$600 |
| Engines (2) | 157 |
| Avionics | 98 |
| Non-recurring, Incl GFE ⁹ | <u>96</u> |
| TOTAL | \$951 |

UH-60A

(U) The Preliminary Design Review (PDR) was held at Sikorsky on 14-17 February 1977. The purpose of this review was to assure that the design approach was consistent with the design criteria and airworthiness standards.

(U) In June and July 1977 the Critical Design Review (CDR) were held at Sikorsky. The purpose of these reviews was to assure that design was in accordance with requirements prior to major commitment to fabrication.

T700 Engine

(U) A review of the status of the T700 cost reduction efforts was held 8-9 February 1977. The T700 engine 1500 hour Accelerated Simulated Mission Endurance Test (ASMET) began in July. This accelerated test will demonstrate engine operation and durability with the engine configured to simulate the actual aircraft installation and vibration. It will last approximately one year, with scheduled completion date of July 1978.

⁹Includes GFE non-recurring production costs, allowance for change, and management reserve. The original airframe DTC goal of \$600K remains unchanged.

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Two T700 engines which successfully completed the 150 hour MQT tests subsequently entered into 1000 hour accelerated endurance tests which started in April and May 1976. One engine maintained a lead in accumulating time and was subjected to a scheduled inspection every 150 hours. The other engine was to operate "on condition" for the entire test without any scheduled teardown. After completing its 1000 hours endurance running in September 1977, the scheduled inspection engine was undergoing a teardown and inspection. The "on condition" engine will complete its 1000 endurance test hours in November 1977.

(U) Technical reviews of the T700 maturity program were held at General Electric in December 1976 and March, June and September 1977. These detailed technical reviews were held approximately every three months to review the technical status of the maturity program and to provide General Electric with technical guidance and direction for the next three months.

Materiel Fielding Plan

(U) In September 1977 FORSCOM coordinated on draft Materiel Fielding Plan and Statement of Quality and Support for initial fielding of UH-60A BLACK HAWK.

(U) BLACK HAWK Materiel Fielding working group had its initial meeting in September 1977 to make new players from newly established Commodity Command offices aware of the program and to make initial coordination for future program requirements.

(U) On 28 July 1977, the Jet Engine Depot Maintenance Interservice Study Group met at San Antonio Air Logistics Command to review interservice overhaul capability for the T700-GE-700 engine and submit a recommendation to the Joint Logistic Commanders for DOD depot maintenance responsibility.

(U) As it built up in the Army inventory, the UH-60A, powered by the T700 engine, will gradually phase out the UH-1, powered by the T53 engine. It was the Army's desire to introduce the T700 into the Corpus Christi Army Depot (CCAD) as replacement workload for the T53. CCAD had adequate capacity and capability to absorb the projected T700 workload without facility/equipment additions other than those already programmed as part of routine facility modernization. Special tooling and peculiar ground support equipment cost was relatively modest and would be the same regardless of depot site selected. The Army was the initial and only service presently programming use of the T700. Other Air Force and Navy depots could accept the T700 workload with the start-up and operating costs being essentially the same as at CCAD; however, there was no significant advantage to recommending any one over the others.

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(U) The study group recommended to the Joint Logistics Commanders (JLC) that the Army be designated as the DOD overhaul point. This decision was approved on 28 September 1977 by the JLC.

Government Competitive Test (GCT)

(U) During the period 12 October to 9 November 1976, in-flight artificial icing test, utilizing the CH-47C Helicopter Icing Spray System (HISS), was successfully completed on the BLACK HAWK candidate designs. The test was conducted in the vicinity of Fort Wainwright, Alaska by the US Army Aviation Engineering Flight Activity in conjunction with Sikorsky and Boeing Vertol, the airframe manufacturers.

(U) The BLACK HAWK Government Competitive Test (GCT) of the Sikorsky and Boeing candidate designs was concluded with the completion in December 1976 of the Climatic Laboratory Testing at Eglin AFB, Florida. Ground test vehicles were utilized for the climatic evaluation and were subjected to temperatures from -65°F to +125°F.

(U) The GCT, which consisted of approximately 800 hours per candidate design, was accomplished during DT/OTII from March to December 1976. It provided sound technical data for source selection and demonstrated that the BLACK HAWK was ready to transition into production and final engineering development (Maturity Phase) testing. Upon completion of source selection proceedings, maturity and production contracts were awarded on 23 December 1976 to Sikorsky Aircraft Division of United Technologies Corporation.

Contractor Maturity Testing

(U) Maturity testing commenced in January 1977 with the initiation of a stabilator reprogramming effort to improve visibility and finalize the stabilator schedule for production. First flight of the Maturity phase was conducted 21 January 1977 on prototype S/N 73-21650. Following update, the remaining prototypes flew on 25 March (S/N 651) and 20 May (S/N 652).

(U) Contractor Maturity testing was proceeding satisfactorily. A gear pattern development test was conducted from April to May 1977 on the modified main transmission input module to verify the input module dynamic gear patterns. A 50-hour Pre-flight Acceptance Test (PFAT) was conducted on the input module following the gear pattern development test and it was successfully completed on 24 June 1977.

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(U) A pylon and stabilator pre-flight proof load test was conducted in July 1977. The pylon and stabilator reacted limit loads without yielding. A pylon and stabilator shake test was conducted from July to September 1977 and the pylon shake test was successfully completed.

(U) Fatigue testing of specimens deferred from the BED phase commenced in September 1977 with the initiation of the tail rotor rotating controls fatigue test. In addition to the stabilator reprogramming effort which took place from January to September 1977, contractor testing on the prototype aircraft included tethered hover testing; the evaluation of vibration absorber configurations; level flight performance testing; stabilator evaluations; and flight evaluations of the Electronic Flight Control System (EFCS). It also tested the evaluation of various Electronic Control Units (ECU) configurations for the purpose of providing performance data to General Electric, who provided the BLACK HAWK engines, and production avionics, navigation and communication testing. Since January 1977, 281 flight hours were accumulated on the prototype aircraft, 110 of which were flown by the Army.

Government Verification Testing

(U) A Northern CONUS test was conducted from 7 to 26 March 1977 by the US Army Aircraft Development Test Activity (ADTA) at Fort Drum, New York. It revealed several discrepancies, the fixes for which were being incorporated for production. The purpose of the Northern CONUS test was to evaluate the helicopter in a cold weather environment of sub-freezing temperatures and moisture in the form of wet snow and freezing rain. Also, the ADTA performed a Radar Reflectivity Survey and an Armament Subsystem Demonstration in April 1977. The Radar Reflectivity Survey was conducted to obtain a base line radar signature of the BLACK HAWK in a clean configuration, and the Armament Subsystem Demonstration was conducted to measure airframe and gun mount stresses and toxic gas levels as a result of weapons firing. Over 110 flight hours were accumulated during the Government testing from 7 March to 15 April.

Milestones

(U) The following major milestones were accomplished during FY 1977:

| <u>Date</u> | <u>Milestone</u> |
|--------------|--------------------------------------|
| October 1976 | Baseline Cost Estimate DRC |
| October 1976 | Decision Risk Analysis Completed DRC |

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| <u>Date</u> | <u>Milestone</u> |
|---------------|--|
| November 1976 | Independent Parametric Cost Prepared (67) COA/Joint Team/DRC |
| November 1976 | Independent Evaluation DT II Completed (62 & 63) OTEA |
| November 1976 | ASARC III/DSARC II (68-71) DCSRDA OSD/DRC |
| November 1976 | BLACK HAWK Production Readiness Review Was Held |
| November 1976 | Received Sikorsky and Boeing's Best and Final Offers for BLACK HAWK Low Rate Initial Production (LRIP) |
| November 1976 | The T700 Engine Advance Tooling Material Con- tract (DAAJ01-77-C-0061) was Awarded to General Electric (GE) - Amount of Contract \$855,625 |
| November 1976 | The T700 Engine Facilities Contract Was Awarded to GE. Amount of Contract \$2,133,548 |
| December 1976 | DT II Complete (51) DRC |
| December 1976 | GE was awarded a Contract (Mod 6 to DAAJ01-76- C-0068) for Detail Tool Design on the T700 Engine. This was a Cost-Plus-Incentive Fee Contract in the amount of \$5,240,393 at target price. |
| December 1976 | GE was awarded a Contract (Mod 12 to DAAJ01-75- C-0360) for Cost Reduction on the T700 Engine. This was a Cost-Plus-Incentive Fee Contract in the amount of \$5,852,056 at target price. |
| December 1976 | GE was awarded the Initial Production Contract (DAAJ01-77-C-0002) for the T700 Engine. This contract covered the first year of the BLACK HAWK Program. This was a Fixed-Price-Incentive (Firm Target) Contract in the amount of \$35,258,364 of which \$42,300 was Firm Fixed Price. |

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| <u>Date</u> | <u>Milestone</u> |
|---------------|---|
| December 1976 | GE was awarded the Spare and Repair Parts Contract (Mod 1 to DAAJ01-77-C-0002) for the first year of the BLACK HAWK Program. This was a Fixed Price Contract in the amount of \$3,100,000. |
| December 1976 | Sikorsky was awarded a Contract (DAAJ01-77-C-0001) for the Initial Production of the BLACK HAWK A/F. This was a Fixed-Price-Incentive Contract with Firm and Successive Targets in the amount of \$83,443,800. |
| December 1976 | Sikorsky was awarded a Contract (Mod 100 to DAAJ01-73-C-0006) for the BLACK HAWK Maturity Phase and Verification Testing. This was a Cost-Plus-Incentive Fee Contract in the amount of \$44,687,390. |
| December 1976 | Sikorsky was awarded a Contract (Mod 100 to DAAJ01-73-C-0006) for the completion of the producibility engineering and planning on the BLACK HAWK A/F. This was a Cost-Plus-Incentive Fee Contract in the amount of \$16,492,116. |
| December 1976 | The Advance Procurement Plan (APP) No. 4 Amendment #2, was approved by the Assistant Secretary of the Army (I&L). This Amendment reflected the T700 Engine requirement for BLACK HAWK LRIP on a single year basis rather than a three year procurement. |
| January 1977 | The SSEB and Director of Procurement and Production conducted a debriefing for Boeing Vertol Company, the losing competitor. |
| January 1977 | The SSEB and Director of Procurement and Production conducted a debriefing for Sikorsky Aircraft Division, the winning BLACK HAWK competitor. |
| January 1977 | The Blisk Impeller development effort was awarded by Modification P00007 to Contract DAAJ01-75-C-0844. |

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| <u>Date</u> | <u>Milestone</u> |
|---------------|--|
| January 1977 | ASA (R&D) signed D&F for T700 growth engine authorizing negotiation pursuant to 10 U.S.C. 2304(a)(11) in the estimated amount of \$14,439,000 for Alternate A and \$15,562,000 for Alternate B. |
| February 1977 | Loan Agreement, DAAJ01-77-L-0006, for retention of two YT700-GE-Engines by Boeing Vertol was signed. Period of Agreement - through June 1977. |
| March 1977 | MIPR for \$50,000 issued to Naval Research Lab for conduct of Radar Reflectivity Testing. |
| March 1977 | Mod 106 was issued against Contract DAAJ01-72-0381 for the Specific Fuel Consumption (SFC) penalty of \$761,530 for General Electric's failure to meet the SFC goal established on the contract. |
| April 1977 | Issued Stop Work Order on fluidic SAS and FAS on the Maturity Contract with impact on BLACK HAWK maturity and production. |
| April 1977 | Modification was executed to authorize Sikorsky to start effort on development of a new Electric Flight Control System. Amount obligated \$275,000. |
| April 1977 | Release of Training Device Proposal (DRC) |
| June 1977 | The T700 Engine RFP (0298) for the second year of BLACK HAWK production was issued to General Electric Company. |
| August 1977 | Procurement Plan No. 5, Amendment #1 - Alternate Vendor Cost Reduction Program for T700 Engine was approved by the AVRADCOM Director of Procurement and Production (final authority). |
| August 1977 | Final QQPRI(99) TRADOC |
| August 1977 | Final MOS Decision (99) DCSPER |

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| <u>Date</u> | <u>Milestone</u> |
|----------------|--|
| August 1977 | Award Contract for Training Devices - DRC |
| September 1977 | General Electric was awarded a cost contract in the amount of \$1,195,410 to procure peculiar equipment required to manufacture T700 Blisks and Impellers. |
| September 1977 | UTTAS officially renamed BLACK HAWK |

Advanced Attack Helicopter (AAH)

Background

(U) The AH-1G Cobra, a modified version of the UH-1 Utility helicopter, was the Army's first operational attack helicopter. It was bought "off-the-shelf" in 1967, and was intended to serve as an interim system for Vietnam requirements while the Army worked out the problems of what would hopefully be the optimum system.

(U) Two years before the fielding of the AH1G Cobra in Vietnam, a study had been conducted to examine the requirements, as brought to light in Vietnam, for an attack helicopter. This led to the Advanced Aerial Fire Support System (later named the Cheyenne). However, because of the complexity and escalated cost of the Cheyenne, an Army Task Force (Marks Group) was convened to examine the Army's requirements for its future attack helicopter.

(U) The objective of the study was to reexamine the requirement, issued in 1965 by the Army, for the Cheyenne, to realistically define the future requirements for the Army's first line attack helicopters, and to define the performance, equipment, and ordnance to meet these requirements with minimum cost and complexity. Associated with this study was an evaluation to determine whether the Cheyenne development should be completed, with its full design system capability, or modified to reduce its cost, complexity, and performance; whether the new requirement might be better met with an industry developed prototype design, or whether a completely new advanced design helicopter should be developed.¹⁰

¹⁰ AAH PMO, Annual Historical Summary, 15 Nov 76, p. 2.

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(U) Before the study could ascertain whether to go ahead with the Cheyenne as planned, modify it to reduce costs, or go either to an industry-developed or totally new prototype, the Senate Armed Services Committee terminated the program in August 1972 by deleting appropriations for it, citing concern over excessive costs and anticipated manpower support requirements.¹¹ The task force study did conclude, however, that a new materiel need document was required based upon cost and mission effectiveness.

(U) On 28 September 1978 DA approved the materiel need document. Also in September 1972, the US Army approved an Advanced Attack Helicopter System to provide greater agility, hover performance, and heavier aerial fire support capability than currently possessed by existing Army aerial weapons systems. It was agreed to establish a design-to-cost goal of \$1.4 to \$1.6 million per copy including recurring flyaway costs, in FY 1972 dollars. The request for proposal (RFP) emphasized meeting the cost goals and recommended reducing both the data requirements and government management contract procedures during development. On 10 November 1972 the Deputy Secretary of Defense authorized the release of the AAH, specifying a \$1.4 million to \$1.6 million (FY 1972 constant dollars) constraint on the recurring fly-away design-to-unit production cost.¹²

(U) The Deputy Secretary of Defense authorized the Army, on 22 June 1973, to initiate a two-phase development of the Advanced Attack Helicopter. Phase 1 was to be a competitive development for selecting the best helicopter airframe to enter Phase 2, full scale engineering development. Phase 2 would then focus on completing subsystems (missile, cannon, rocket, target acquisition and night vision) development and their integration into the winning helicopter.

(U) On 22 June 1973, Bell Helicopter Company and Hughes Helicopters were awarded competitive Phase 1 Engineering Development contracts to design and fabricate a static test article, a Ground Test Vehicle, and two flying prototypes to be evaluated in the competitive fly-off.¹³ The Bell Helicopter candidate, a two-bladed

¹¹SSAC's rationale for terminating the Cheyenne program was their concern about the excessive cost and anticipated manpower support requirements for the Cheyenne. Meyers, F.W. Jr. and Horton, Cyril F., "Advanced Attack Helicopter, A Case History," Defense Management Journal, Vol 10, No. 4, Sep 74, p. 37. AAH PMO, Annual Historical Summary, 15 Nov 76, p. 2.

¹²SAR 30 Sep 77, p. 2.

¹³AAH Program Summary as of May 77.

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tricycle-gear aircraft with pilot located in front, was designated the YAH-63 and the Hughes Helicopters candidate, a four-bladed, three point-gear system with pilot in rear seat, the YAH-64. Both aircraft used twin T-700 General Electric turbine engines rated at 1560 SHP each.

(U) Following first flight of the prototypes in September 1975, both companies conducted extensive developer tests of their aircraft before delivering them to the Army for Government competitive tests at Edwards Air Force Base, California. Government testing (fly-offs) were completed on 30 September 1976.

Program Development

(U) AAH. Development Test/Operational Test (DT/OT)-1 was completed as scheduled on 30 September 1976 with each contractor's aircraft logging more than 90 flight-hours in DT-1 and 22 flight hours in the user evaluation OT-1. Results of the Government Competitive Test (fly-off) were used to support the AAH Phase 2 Source Selection Evaluation Board (SSEB) members in their fact finding and evaluation of the Contractor's Phase 2 proposals. The AAH DSARC held on 7 December 1976 resulted in approval of the AAH to enter Phase 2, full scale Engineering Development. Also the source selection results were presented to the Secretary of the Army. Based on these, he selected Hughes Helicopters (YAH-64) as the prime aircraft system contractor for Phase 2, and on 10 December 1976, made a public announcement of the \$317.4 million award.

(U) Phase 2 consisted of modification of the two Phase 1 aircraft, fabrication of three additional air vehicles, sub-systems development, and testing and integration of mission sub-systems into these aircraft. Also, integrated logistics support concept development was initiated with award of the full scale engineering development contract. Training aids/devices and support equipment specifications were reviewed, approved and the hardware items placed on contract. The initial Integrated Logistics Support Management Team (ILSMT), consisting of DA, DARCOM and major commands, conducted the first meeting to direct the contractor in ILS concept development. Formal Logistics Support Analysis (LSA) reviews were conducted to approve the design support approach for logistics considerations. Government Furnished Materiel (GFM) required to support the Phase 1 aircraft and for installation in the forthcoming Phase 2 aircraft was delivered. The contractor was in the process of requisitioning repair parts for that GFM.

(U) In January 1977, OSD reduced the FY 1978 AAH Budget from \$200.0 million to \$100.0 million. This funding reduction resulted in an extension of 10 months to the Development Program and a 12 month delay in the start of the Production Program.

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(U) TADS/PNVS. Also in January 1977, the Program Manager AAH was assigned management responsibility for the systems applications and development effort of the competitive Target Acquisition Designation System and Pilot Night Vision System (TADS/PNVS) by DARCOM.¹⁴ Contracts for competitive development of the TADS/PNVS subsystems were awarded on 10 March 1977 to Martin Marietta and Northrop Corporation. In April 1977 the Preliminary Design Review (PDR) for the Martin Marietta TADS/PNVS was completed; and in May 1977 the Preliminary Design Review (PDR) for the Northrop TADS/PNVS was completed.

(U) Project Managers for the TADS/PNVS, TRAM and PAVE TACK met in August 1977 to coordinate tri-service visionics efforts. This visionics meeting was the first in a series of quarterly meetings required by DDR&E.

(U) Northrop Corporation and Martin Marietta, both of whom had subcontracted to International Laser Systems (ILS) for laser subsystems for their respective TADS, held Critical Design Reviews (CDR) in September 1977.

(U) 30mm Ammunition.¹⁵ The Project Manager's Office for the development of XM788, XM789, and XM799 was established and located at US Army Armament Research and Development Command (ARRADCOM), Dover, NJ. LTC Daniel J. Delany was designated Department of the Army Product Manager for the development of this ammunition, effective 10 December 1976. He reported to the Project Manager for the Advanced Attack Helicopter located at AVRADCOM, St. Louis, Missouri.

(U) The Product Manager was responsible for product management of 30mm ammunition development to include an Americanized ADEN/DEFA HE (XM799) projectile, a Target Practice (XM788) projectile, and a dual purpose round (XM789). Development will also support the AAH cannon system and meet DOD interoperability requirements.

(U) During this period, Hughes Helicopter, gun developer for the AAH was awarded a contract for the development of 30mm ammunition. Hughes, in turn, sublet the development to Honeywell, Inc.

(U) The Martin Marietta and Northrop contracts, as well as those with Hughes Helicopters and General Electric Company (T700 engine) are being renegotiated to reschedule interface actions required to accommodate the program stretch-out due to the FY 1978 budget reduction.

¹⁴DF, DRCPM-AAH-TP, 14 Nov 77, Subj: AHR.

¹⁵DF, DRCPM-AAH-30mm, 14 Nov 77, Subj: AHR.

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Program Cost Estimate

(U) The total AAH Program cost estimate at time of Development Estimate (DE) approval in November 1976 was \$3758.1 million. As of 30 September 1977, program changes and economic escalation was \$295.9 million, raising current cost estimate to \$4054.0 million.¹⁶

(U) The Program Manager was confident that the AAH program would be able to attain all of the technical objectives now designated by contract based upon the currently approved funding for remaining development in Phase 2.

AAH Program Management Structure

(U) One of the Army's top priority programs, the AAH, was structured under the new DARCOM multi-level project concept. Colonel (P) Edward M. Browne assumed program responsibility on 1 June 1976 as Project Manager (PM), AAH, and as Program Manager, AAH, on 10 December 1976. The Project Manager for the TADS/PNVS, and the Product Manager for the 30mm development reported to him and used certain elements of the AAH staff to assist them in their program efforts.

Program Manager's Role

(U) The Program Manager was responsible for overall program management of the AAH System including the aircraft and its related mission equipment and subsystems. He was to direct and control all phases of research, development, procurement, production, distribution and logistic support involved for the AAH and its sub-projects. Also, he was directly responsible for the life cycle management of the AAH and centrally direct, coordinate, integrate, and support the materiel development and acquisition activities of the subordinate Project Manager of Target Acquisition Designation System/Pilot Night Vision System (TADS/PNVS) and the Product Manager, XM 788/789/799 30mm Ammunition.

Smoke/Obscurants

Mission

(U) Office of the Project Manager. The Project Manager, as the focal point for the Army Smoke/Obscurants Program, participated in the determination of requirements with the US Army Training and Doctrine Command (TRADOC); steered the basic technology effort as chairman of

¹⁶SAR 30 Sep 77 (30 Ammo Costs are excluded), p. 7.

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the Smoke/Aerosols Steering Group, planned, directed, and coordinated materiel development and readiness activities through the life cycle management of smoke/obscurants munitions, materials, and dissemination devices to counter obscuration of personnel, ground vehicles, facilities, or for signalling and marking, during tactical operations, and to provide technical assistance and coordinate the test and evaluation of weapons and systems with electro-optical components in a smoke/obscurant environment. This included, along with the PM and Deputy PM, an Assistant PM for Tactical Doctrine and the Configuration Management and Integrated Logistics Management functions.

(U) Liaison Offices (ARRADCOM, ARRCOM, MICOM). Acted as the Project Manager's principle point-of-contact at assigned geographical location serving as the on-site representative and official liaison between the Project Manager and other Army Commands and activities and other agencies and organizations involved in smoke/obscurants activities which interfaced with the Smoke/Obscurants Project Manager's responsibilities. As principal on-site agent for the PM, provided technical advice and assistance as delegated by the Project Manager and apprised the Project Manager of conditions and problems, both actual and potential.

(U) Program Management and Support Division was responsible to the Project Manager to plan, schedule, direct, coordinate, and control the total Project program. It exercised the full-line authority of the Project Manager for the development, submission, justification, receipt, allocation, and execution of all fiscal resources. This provided general administrative services for all organizational elements to include security, transportation, travel, communications, records management, office supplies, safety, training, time and attendance records, mail distribution, suspense control, messenger service, personnel actions, and reports management.

(U) Materiel Development Division managed the research, design, development, engineering, and PEP for assigned systems to assure that they met stated military characteristics and requirements, and program objectives. Assured that equipment entailed design to cost aspects. It formulated Memorandums of Understanding (MOU) with other project managers; and monitored foreign intelligence and assured that appropriate threat and countermeasure studies were being conducted. Managed the technical Data Bank for smoke/obscurants. Also was responsible for coordination of all requirement documents and development plans.

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(U) Product Assurance and Test Division. Planned, developed, managed, and maintained a Product Assurance and Test Program for the life cycle of assigned materiel that was to provide for the establishment, assessment, and preservation of product safety, quality, reliability, and maintainability for assigned systems. It provided technical assistance and coordinated the test and evaluation of weapons and systems with electro-optical components in an environment that included obscurity.

(U) Procurement and Production Division. Provided overall planning, guidance, direction and evaluation relative to the performance of procurement, production, supply and maintenance, to assure timely delivery and optimum support as assigned materiel. It controlled the Product Improvement and the Manufacturing Methods and Technology Program. This division prepared and directed the implementation of the procurement and the production programs, both US and foreign, required to assure the timely and economical delivery of the smoke/obscurants systems to the user.

Milestones

(U) Listed below are milestones for Office of the Project Manager, Smoke/Obscurants from the establishment of the Smoke Project Management Office at Edgewood Arsenal to the M60A1 smoke protection system fielding in September/October 1977.

(U) The Smoke Project Management Office (SPMO) was established in March 1975 at Edgewood Arsenal to be responsive to new Army requirements for smoke formalized by TRADOC in February 1975.

(U) A smoke demonstration was held at Aberdeen Proving Ground in August 1975. As a result of the demonstration, the decision was made to adopt the M239 grenade launcher and the L8A1 smoke grenade for the M60A1 Tank.

(U) As a result of a General Officer armored vehicle review in April 1976, the Vice Chief of Staff, Army, directed that the Smoke PMO be established.

(U) COL Henry R. Shelton was named designee for the OPM-Smoke on 20 June 1976.

(U) Personnel from the SPMO were detailed to the OPM-Smoke on 1 July 1976. They, along with a group from HQ DARCOM, comprised the OPM-Smoke cadre.

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(U) The Project Manager Charter for Smoke/Obscurants was signed on 5 August 1976, establishing the PM as the focal point for smoke to plan, direct, and control all materiel development and readiness activities for the Army smoke/obscurants program. Mission responsibilities also encompass centralized management for testing of E/O devices in a smoke environment, and coordination with TRADOC on the establishment of new smoke requirements and AAO.

(U) The OPM Smoke/Obscurants TDA was approved on 1 September 1976 for a required strength of seven military and 33 civilian positions. Seventeen civilian spaces were to be O&MA funded and sixteen RDT&E funded. However, only three O&MA spaces, along with the sixteen RDT&E spaces, were authorized.

(U) The SPMO personnel moved from the Edgewood Area to the Aberdeen Area of Aberdeen Proving Ground in August 1976. The OPM-Smoke/Obscurants became fully operational on 1 October 1976.

(U) Between January and June 1977, several attempts were made to obtain authorization for additional required O&MA positions. However, only one, an encumbered secretarial position from the SPMO, was approved. Authorization requests for critical financial and administrative management positions were rejected.

(U) The Smoke/Electro-Optical System Test Symposium was held at Harry Diamond Laboratories on 25-26 January 1977, to bring together all organizations within DA interested in testing E-O devices in a smoke environment.

(U) In February 1977, the DARCOM Assistant Secretary for Science and Technology established the Smoke and Aerosol Steering Group (SASG) to be chaired by PM-Smoke. This group is dedicated to the coordination of the DARCOM research and exploratory development programs directed toward the development of smoke producing systems or systems that must operate in an environment of natural or artificially produced obscuration.

(U) The first meeting of the SASG was held in March 1977 at Aberdeen Proving Ground.

(U) The Project Manager was assigned in July 1977 the responsibility for coordinating a DARCOM review and assessment on the Army Scientific Advisory Panel report on "Smoke as an Optical Countermeasure" by the DARCOM Assistant Deputy for Science and Technology. The first working conference was held in August 1977 at Aberdeen Proving Ground.

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(U) Personnel staffing plan was submitted to DARCOM in July 1977, requesting authorization to hire to a minimum essential level of eight military and 35 civilians in FY 1978.

(U) The thermal night sight and other electro-optical systems were tested in a smoke environment at White Sands Missile Range in July 1977.

(U) Field characterization of US inventory smokes was performed at Dugway Proving Ground, September 1977.

(U) Fielding demonstration for M239 launcher/L8A1 grenade/M60A1 tank was initiated at Vilseck Grafenwoehr, Germany in September 1977.

Smoke Munitions¹⁷

(U) Technology in the field of electronics allowed the Army to field a family of antitank guided missiles (ATGM) that greatly improved the ability to engage tanks at extended ranges. These weapons played a significant role in influencing the tactical plans of maneuver units. Along with highly sophisticated tanks, missiles and other weapons, they will significantly influence tomorrow's battlefield.

(U) In October 1973, the impact of ATGM's on the battlefield gained worldwide attention when the less sophisticated Soviet-made "suitcase" SAGGER missile was used with sensational results against the 190th Israeli Armored Brigade fighting in the Sinai desert. In that battle, it was reported that over 130 Israeli tanks were destroyed in two hours. Later, however, the effectiveness of that missile was significantly reduced by Israeli smoke munitions. While the effectiveness of smoke had not been quantified, its importance was not overlooked by the Soviets.

(U) Starting in 1974 and peaking in 1975, a number of articles appeared in the Soviet "Military Herald" which focused on the use of different kinds of smoke against electronic equipment. One of these articles stated: "Smoke screens are finding increasing application in military training. They ensure screening of troops from enemy optical, television, infrared and laser reconnaissance instruments, and produce disturbances in the work of gun-laying systems."

(U) To understand the impact of smoke on electro-optical developments, one needs to go to the laws of physics, which point out that electromagnetic waves can be reflected and their energy absorbed.

¹⁷"Smoke as a Weapon," by COL Henry R. Shaton, Army, August 1977.

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Theoretically, it is possible to create a smoke screen that can reduce the effectiveness of any device that depends on transmission of electromagnetic energy, although such a smoke is not yet available for tactical use.

(U) In the field, the effectiveness of a smoke screen is influenced by such a number of variables that the precise degradation is very difficult to predict. These include the type of smoke, quantity, wind conditions, temperature, relative humidity, terrain, position of the sun and the relative contrast of the target to its background. The effectiveness of a given smoke will depend on the relationship between its particle size, density and depth, and the operating wavelength of the electro-optical system.

(U) Recognizing the impact of obscuration on the effectiveness of our antitank guided missiles does not decrease the importance of those weapons. It does, however, highlight the importance of tactical training in a prolonged smoke environment. Failure to train operational units under these circumstances puts the element of surprise clearly in the enemy's favor. At GM, operators must be trained to understand that the effectiveness of their systems can be significantly lessened by smoke and dust.

(U) Smoke can provide a potent force on a future battlefield. It offers an envelope of protection for troops, weapons and equipment or a screen behind which forces can advance on the battlefield. It can help or it can do serious damage - particularly when our forces are not trained in its use.

(U) The Army RDT&E projects and tasks assigned to the Smoke/ Obscurants Project Management Office:

| | <u>Element Code</u> | <u>DA Project or Task</u> | <u>Title</u> |
|-----|---------------------|---------------------------|-------------------------|
| (1) | 6.36.08.A (AD) | 1X663608D009 | 60mm Ammunition |
| (2) | 6.36.27.A (AD) | 1X663627D204 | Field Smk Assessment |
| (3) | 6.36.27.A (AD) | 1W663627DE82 | Flm, Smk & Incend Mat'l |
| (4) | 6.46.01.A (ED) | 1X664601D144 | Smoke Mortar Rounds |
| (5) | 6.46.09.A (ED) | 1W664609D191 | Flm & Smk, Wpn & Equip |

Only #3 and #5 received any funding during FY 1977. Funding is anticipated for #2 in FY 1978, and for #1 and #4 in FY 1979.

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Advanced Development: Flame, Smoke & Incendiary Materiel

(U) Electro/Optical (E/O) Devices Countermeasure Testing. A Smoke Testing Symposium was held on 25-26 January 1977 at Harry Diamond Laboratory to establish the framework for the US Army smoke testing program. In July 1977 the thermal night sight and other E/O devices were tested in a smoke environment. During September 1977, field characterization studies were performed for US inventory and foreign smokes at Dugway Proving Ground, Utah. Results of these tests are now being evaluated.

(U) 155mm Improved Screening Smoke Projectile. Competitive development of Red Phosphorus (RP) vs Epoxy White Phosphorus (E-WP) payload was initiated in November 1976 to provide IOC in 1983. Chemical System Laboratory (ARRADCOM) at Edgewood Arsenal developed design for the E-WP (XM801) round. Large Caliber Weapons Systems Laboratory (ARRADCOM) at Picatinny Arsenal developed a design for an RP (XM803) round. In May 1977, a contract was awarded to Buck KG, Federal Republic of Germany, to design and fabricate projectiles (XM802) filled with an FRG RP mix. This contract was being managed by CSL. Testing of five different concepts for the XM801 revealed that the E-WP fill breaks up and does not produce an effective ground screening smoke. Therefore, the XM801 program was terminated in September 1977. Both the XM802 and XM803 were statically fired and both produced excellent smoke lasting 5-6 minutes.

(U) 81mm Improved Screening Smoke Projectile. Competitive development of White Phosphorus wicks vs RP smoke payloads was initiated in November 1976 to achieve IOC in FY 1983. A contract was awarded to Buck KG, FRG, to adapt their RP fill for 81mm application. A design trade-off study was completed in May 1977. This study considered three possible design alternatives for the improved round; the M374 HE round configuration, the M301A3E2 illuminating round configuration, and a stretched illuminating round optimized for smoke. The M301A3E2 was selected for the on-going competitive AD program. Preliminary tests have been performed, and both the WP wick and the RP approaches appear promising.

Engineering Development: Flame & Smoke, Weapons & Materiel

(U) L239 Launcher/L8A1 Grenade/M60A1 Fielding Program. Type classification action for the M239 six tube launcher and the L8A1 grenade was completed during FY 1976. Program plans for initial procurement and follow-on procurement for the entire M60A1 fleet were established during the summer 1976. In January 1977, a contract was signed with the United Kingdom (UK) for 1,000 launchers and 235,000 grenades to be delivered to USAREUR starting October 1977. Data

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rights and US license agreements for US production were also obtained. In April 1977, a contract was awarded for the M60A1 interface kit for the initial fielding program. During September 1977, initial delivery was made to USAREUR, and the initial fielding demonstration was held at Vilseck/Grafenwoehr, Federal Republic of Germany (FRG). The significance of fielding was (a) the prime assets of the tank fleet were then provided an immediate smoke screening capability, (b) the milestone was met on time and within cost, (c) fielding was achieved within two years of the decision to buy the UK system, and (d) a system involving both US and UK components was operational.

(U) XM243 Four Tube Launcher. During FY 1976 TRADOC recommended that a smoke system be adapted to various infantry vehicles. Demonstration and testing of four tube launchers mounted on APC and MICV was performed at APG during May 1976. In October 1976 a program was initiated to type classify the XM243. A contract was negotiated with UIC in November 1976 to obtain four tube hardware to support vehicle Project Managers. In July 1977, the US received the UK Technical Data Package for the four tube launcher, and in August 1977 the XM243 Development Plan was distributed for review/concurrence. In September 1977, the TECOM DT II plan was approved by this office.

(U) Expanded Launcher Application Program. During FY 1976, programs were initiated to adapt the M239 launcher (six tube) to the M88 VTR and the XM243 launcher (four tube) to the MICV (now Fighting Vehicle Systems (FVS)). In December 1976, a program was initiated to adapt the XM243 launcher to the ITV.

(U) M88 VTR/M239. A demonstration of M239/M88 vehicle installation was accomplished during April 1977. In May 1977, M239's were installed on two M88A1 initial rebuild test vehicles. In August 1977, the M88 Project Officer initiated Phase I and II Engineering Change Proposals for M88A1/M239 interface hardware.

(U) MICV (FVS) XM243. In March 1977, a support agreement was signed between PM-MICV and PM-Smoke and in June 1977, initial funding was received from OPM-FVS.

(U) ITV/XM243. In January 1977, ITV-TIWG was initiated to integrate XM243/ITV compatibility testing into the ITV test program. In March 1977, initial funding was received from OPM-ITV. In May 1977, XM243's were installed on ten ITV's. In September 1977, TECOM issued XM243/ITV safety release for OT III.

(U) In September 1977, a meeting was held with OPM-XM1 to review and establish objectives for the XM1 smoke protection program.

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(U) Armored Vehicle Smoke Exhaust System. In October 1976, a development contract was awarded for a diesel exhaust smoke generator for M60A1/A3 tank engines leading to a DEVA-IPR in June 1979. In April 1977, planning was initiated to accelerate the IOC date of this system. A special in-process review established a new initial operational capability in 4th Quarter, FY 1979.

Production of Standard Items

(U) In November 1976, a 155mm M116E2 product improvement program was initiated. In addition, 105mm M84 product improved round production was initiated.

(U) During the second quarter, FY 1977, coordination with ARRCOM/ARRADCOM was effected to provide independent US RP capability for L8A1 grenade and support to developmental RP and white phosphorous munitions. In September 1977 action was initiated toward FY 1977-81 multi-year procurement of L8A1 smoke grenades to exploit the significant price discounts offered by the UK for large quantity single orders.

Committees and Interfaces

(U) Interface with TRADOC. The Assistant Project Manager (APM) for Tactical Doctrine was assigned to this office at the beginning of this reporting period. He participated in the determination of smoke requirements for weapons systems, smoke munitions and training devices, and publications with TRADOC. Initially, this was accomplished through HQ TRADOC and later through the Combined Arms Center, and currently through the TRADOC System Manager Smoke, both located at Ft. Leavenworth, Kansas. He participated in several TRADOC Smoke Studies and is currently chairing a joint study group for a second generation armor protective smoke system. The APM participated in Army and Tri-service conferences and meetings briefing the Army Smoke Program and providing technical information. Significant events include a program review and update with the TRADOC ADCS Combat Development in December 1976, conduct of the Armor Protective Smoke System Study in January 1977, a presentation at the TRADOC World-wide Liaison Officer's Conference in May 1976, Combined Arms Smoke Program/Testing Meeting in July 1977.

(U) Quadripartite Working Group Interface. The Office of the Project Manager, Smoke, was involved in the Infantry, Armor, Artillery and Combat Development Quadripartite Working Groups (DWQ) (US, UK, Canada and Australia). The PM made a Smoke Program presentation at TEAL XX in Hawaii in May 1977, a Chief of Staff of Quadripartite Army level conference and again at QWG/CD in Canada in August 1977. During

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the reporting period OPM Smoke provided comment to QWG agenda items and had been working closely with the Concepts Analysis Agency in Bethesda, Maryland which was tasked to prepare a smoke concept paper through the year 2000 for QWG/CD.

(U) Army Scientific Advisory Panel (ASAP) Interface. Response to the Army Scientific Advisory Panel (now the Army Science Board) Report "Smoke as an Optical Countermeasure" (Nov 76 Secret) has been prepared by an Ad Hoc Committee for the review and assessment of optical countermeasures, chaired by PM-Smoke. The committee met on 23-24 August and 18-19 October 1977 at APG. A draft report of the review and assessment was being coordinated among the participating DARCOM commands.

(U) Smoke Aerosol Steering Group (SASG). The DARCOM Smoke and Aerosol Steering Group is made up of representatives of OPM-Smoke, ARRADCOM, ERADCOM, MERADCOM, MIRADCOM, TECOM and HEL. PM-Smoke is chairman of the Steering Group. The Steering Group has met at Aberdeen Proving Ground (APG) 29-31 March, 28-29 April, and scheduled to meet 29-30 November 1977. The purpose of the meetings was to coordinate programs directed to advancing the technology and supporting the development of systems which must effectively operate in an environment of natural and artificially produced obscuration. The product of the first two series of meetings was the DARCOM approved Smoke and Aerosol Steering Group Research and Exploratory Development Plans.

(U) Joint Technical Coordinating Group/Munition Effectiveness (JTTCG/ME). The JTTCG/ME Tests at Dugway Proving Ground were initiated to determine cloud characteristics and attenuation measurements in the visual through the IR range for smoke hardware currently in inventory and of foreign origin. Information from these tests was intended as input for modeling and for planning Smoke Week, where electro-optical systems managers were to have the opportunity to evaluate their systems in a characterized smoke environment. The tests were planned in three phases: Phase I for baseline data on single smoke sources (HC Canisters and WP Wicks/RP Wedges); Phase II for inventory munitions including the L8A1 smoke grenade; and Phase III for foreign smoke projectiles. "Smoke Week" was to be conducted during the period of 14-25 November 1977. E/O System Managers plan to evaluate their hardware in the smoke environment. Completion of Phase I tests will follow "Smoke Week."

(U) Test Integration Working Groups (TIWG). OPM Smoke held TIWGS on two development smoke items. On 5 April 1977, the XM243 launcher TIWG was held at APG to coordinate test needs for type-classification action. The 81mm Improved Smoke Projectile TIWG was held at APG on 28 September 1977 to review the independent evaluation

[REDACTED]

plans (IEP) and test design plan (TDP) for DTI, the OPT for OTI, and to formulate the draft Coordinated Test Plan. On 8 November 1977, the XM802/803, 155mm Projectile TIWG will be held at APG to coordinate test needs for DT/OT I. In addition, Product Assurance and Test Division personnel attended ITV and SLUFAE TIWG's to participate in plans for those vehicle's testing of smoke grenade launcher systems (M239 and XM243).

(U) Smoke/EO Systems Test Symposium. The Smoke Symposium was convened at Harry Diamond Laboratory on 25-26 January 1977. The overall objective of the symposium was to acquire input for centralized management of all smoke testing by OPM-Smoke. To accomplish this, it was necessary to determine testing gaps that existed within the Smoke Community. TRADOC's 23-item E/O Priority List was used as an indication of desirable smoke tests. Presentations were solicited to accomplish the objective. Proceedings were mailed to attendees on 17 March 1977.

Nuclear Munitions

65-PM NUC-77

(FOUO) At the beginning of October 1976 the authorized strength of the OPM Nuclear Munitions was 39 civilian and 9 military spaces for a total of 48 people. Twenty-seven personnel (21 civilian/6 military) were on board. By the end of FY 1977, 11 civilians were added to a total of 38 personnel (32 civilians/6 military).

(FOUO) Subsequent mandates from higher headquarters dictated that several changes be made in the civilian grade structure which lowered the average grade level to 11.43, below the target of 11.46. A significant factor in this accomplishment was the elimination of one GS-00801-15 Supervisory General Engineer position which was made possible by a management improvement action of combining two existing divisions without affecting overall efficiency.

(FOUO) Manpower utilization in FY 1977 was 25.5 civilian man years and six military at a cost of approximately \$1.197 million. Total magnitude of the nuclear programs managed was \$57.1 million.

(FOUO) At the end of FY 1977, this office had negotiated and had in operation six support agreements (one each with ARRCOM and PM's, CAWS, LANCE, PERSHING, TRADOC and M110E2). Additionally, there were three Memorandums of Understanding with other PM's/Commands.

[REDACTED]

(FOUO) A Concept Plan for reassignment of the US Army Materiel Development and Readiness Command Field Office (DARCOMFO), located in Albuquerque, from the jurisdiction of HQ DARCOM to the OPM Nuclear Munitions, was staffed and approved during the past year. On 1 October 1977, this change became official and the six spaces involved (4 civilians/2 military) were transferred intact raising the Nuclear PM Office's to 42 civilians and 11 military.

M422A1 8" Projectile

(FOUO) The worldwide retrofit of M422 projectiles to incorporate the centrifugal ball device (CBD) was completed three months ahead of schedule in June 1977. The M422 projectile became the M422A1 upon completion of this action.

(FOUO) A correspondence DEVA IPR was conducted to extend type classification of the M422A1 and M424/M424A1 projectiles which included utilization of the M188 propelling charge. The DEVA IPR approved this increased capability conditionally. It limited the firing of the M422A1 and M424/M424A1 projectiles from the M110A1 SP howitzer to combat emergency conditions only. This limitation would not pertain to the M110A1E1 SP howitzer (M110A1 with muzzle brake). Secondly, it required that the M424/M424A1 projectiles with either M80 or M188 charges could be fired only from new M201 cannon tubes (approximately first half life). In this connection, plans were formulated in the DEVA IPR to provide safety certification from worn tubes. Initial actions accomplished in this regard were the preparation of funds estimates and the release of M424/M424A1 projectiles from stockpile. Also, production of H4277 extractors continued at Watervliet Arsenal (WVA) and at Army Materials and Mechanics Research Center (AMMRC). Extractor containers fabricated at the Seneca Army Depot (SEAD) were not available for initial delivery of extractors due to difficulties in procuring long lead time items, namely, aeroquip clamps.

(FOUO) Forecasted actions included the conduct of the M424/M424A1 safety certification test from a worn M201 cannon tube provided that hardware release was obtained from DA (DSCOPS/DSCRDA), and the initial deliveries of H4277 extractors and overpack actions.

XM753 Projectile

(FOUO) A pre-DEVA in-process review (IPR) was held on 17 August 1977 to establish the DARCOM position for the DEVA IPR originally scheduled for 27 September 1977. At this meeting, it was decided to postpone the DEVA IPR until early in December 1977. The purpose of this review was to standardize TC the XM754 trainer, XM735 proximity fuze, XH4278 spanner wrench, XH4272 extractor, and the XM613 shipping and storage container.

[REDACTED]

(FOUO) The XM735 fuze flight testing, JFF-1 joint full function tests, and JB1 joint ballistic tests were successfully completed. Also, the initial development testing of the new pinned rocket motor/body joint was successful. All future joint ballistic and joint full function projectiles will have the pinned joint.

(FOUO) The DTII/OTII program has been initiated, and the environmental preconditioning of the XM735 fuzes for fuze safety tests were begun. Plans were made to type classify the XM753 projectile after successful final DRAAG and SPR.

Stockpile Improvement Studies

(FOUO) The committee on ASSIST (Army Stockpile Safety Improvement Study) completed Phase 1 reviews of all systems and an implementation report was sent to HQ DARCOM during August. DA-approved procedural changes were being implemented.

(FOUO) Direction was received to prepare five Product Improvement Proposals (PIP) and two PCP (Program Change Proposals) to implement provisionally approved hardware modifications. This action, however, was postponed because required funds had not been received.

(FOUO) As pointed out in the ASSIST report, a definite need existed for both procedural and hardware improvements to upgrade the safety, security and command control of the Army stockpile.


LANCE WHS

(FOUO) The developmental flight test items began preconditioning in late July 1977. Although originally scheduled for White Sands, manpower problems there forced a switch in the preconditioning phase to Redstone Arsenal in order to prevent a major program delay.

(FOUO) To circumvent a production slip, a letter contract for 50 percent of the first year buy of M238E1 was negotiated. Thus the contractor was able to prepare for full production, minimizing the chance for a slip in production milestones.

(FOUO) Full AK-warhead capability tests were run at Lawrence Livermore Laboratories in early August. This will be the final compatibility tests prior to the developmental flights.

(FOUO) Military Interdepartmental Purchase Requests (MIPR) were submitted to ERDA for the W70-3 Type 3B EOD, Type 3D LLC and cutaway explosive ordnance disposal (EOD) warhead trainers. These MIPR's were all accepted. LLC trainers for use with the M234E3 will be


produced. It was estimated that the first of these trainers were to be available in October 1978 in lieu of the May-June 1978 time frame previously reported (IOC will not be impacted). There will be five Type 3B trainers and two cutaways.

(FOUO) Raymond Engineering will begin prototype design tests for the complete hardlink arming/safing device (HLASD) in October. Tests are scheduled for completion in November with the concurrent evaluation completed by the end of the same month.

M454 Projectile

(FOUO) Department of Energy (DOE) completed the investigation of the effects of the HE determination on M454 projectile stockpile life and results were not as serious as originally feared. As part of the stockpile surveillance program the status of the HE will be analyzed periodically.

(FOUO) The testing phase of the US M454/FRG M109G compatibility program was conducted at the proving ground at MEPPEN, FRG during the period of 5-24 May 1977. No anomalies occurred. Data reduction and analysis was being accomplished at BRL and TECOM.

(FOUO) DA was requested to determine need for establishing compatibility of the M454 with M198 howitzer by the M198 IOC date. ARRADCOM and TECOM reviewed the test plan and verified their position that testing was mandatory.

(FOUO) The FRG Test Director was requested to visit the US during October 1977 to finalize the M454/M109G test report in conjunction with the TECOM Test Director. Copies were to be provided to the DOE complex to certify that the M454, when fired from the M109G, will not be subjected to environments above those stated in their major assembly release for the M454.

PERSHING II (PII)

(FOUO) The Phase II study was updated with DOD reviewing the AB/SB Phase III package, and requesting DOE/DA to assess impact of adapting an existing warhead to PII application.

(FOUO) Breadboards of adaption kit components have been designed and components are being fabricated. The life cycle cost estimate was completed and a detailed, Comptroller-validated LCCE, covering all portions of AB/SB development, was submitted to the PERSHING Project Office.

[REDACTED]

(FOUO) Expectations were that a single adaption kit system contract will be awarded. It was expected that breadboard testing will be completed and design of second generation hardware initiated early FY 1978.

XM785 Projectile

(FOUO) The overall program was officially approved as of the end of FY 1977 and the Phase III request was prepared for expeditious submission to DOE. Also, a transonic aeroballistic characterization study plan for the M549 was prepared. It entailed testing to determine the first maximum YAW distribution and testing at induced YAW angles ranging from 4 to 18°.

(FOUO) The draft Life Cycle Cost Estimate (LCCE) was distributed. These estimates were being examined to determine whether recent guidance will result in any modification to the draft LCCE. A revision to the LCCE was being prepared which will incorporate the latest philosophy relative to the breakdown of 6.3 and 6.4 funds.

(FOUO) Logistic support, training and maintenance test support planning were started and preliminary actions taken.

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CHAPTER IX

PROJECT MANAGEMENT: EQUIPMENT AND EQUIPMENT SYSTEMS *

Munitions Production Base Modernization and Expansion (MPBME)

Introduction

(U) The Project Manager (PM) was responsible for project management of the MPBME Program. He exercised centralized management authority over the planning, direction, control, and execution of the program at all US Army ammunition plants and arsenals and for government equipment located at contractor-owned and operated facilities included in the program. Also, the PM was the focal point for operational control of the program. The Corps of Engineers (CE) and DARCOM activities executed the program under his direction and close monitorship. The PM was delegated the full line authority of the CG, DARCOM for the centralized management and execution of his approved program.

(U) The formulation and execution of that part of the Provision of Industrial Facilities (PIF) element in the Procurement of Ammunition, Army (PAA) Production Base Support Program that applied to the PBM Program was also a responsibility of the PM. This included but was not limited to the following major project areas: propellants and explosives and related acid facilities, small caliber ammunition facilities, and pilot plants. Another responsibility included PEM (Production Engineering Measures) projects related to the program. Ammunition PEM projects within the purview of other PM's or activities are coordinated with this office prior to the initiation of the related facility project.

(U) Modernization was a comprehensive engineering and construction program that used the technology and resources of the materials handling, machine tool, chemical processing, computer and construction materials industries throughout the United States. The chief goal was to completely overhaul and modernize ammunition production facilities, which concerned officials in the late 1960s felt were inadequate to meet future needs. When the Vietnam conflict broke out, the country had only 26 Government plants in the production base, down from a peak of 113 in World War II.

* Material in this chapter was submitted by the Project Manager Offices concerned.

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(U) These remaining World War II and Korean War vintage facilities were put to a hard test. During the 1950's most of the procurement budget was devoted to deterring nuclear war with little allocated to provide for the possibility of conventional war. Laid-away facilities required proper cleaning and preservation. With little money available, maintenance suffered. Available funds during the Vietnam era were used to acquire only those modern facilities essential to expansion, introduction of new items and replacement of completely worn-out facilities and equipment which supported the conflict. As a result, production facilities had reached a point where equipment could not be reactivated without extensive rehabilitation or replacement after being laid away.

(U) The ammunition production base was national in scope. It included production equipment, facilities, related industrial production equipment and associated manufacturing technology required to support the procurement and production of ammunition.

(U) Problems were encountered in the modernization effort. The base was obsolete in nearly every respect, making it necessary to modernize drastically in most instances. There was also a marked decline over the past 20 years in the number of people with ordnance related skills to operate the remaining usable equipment. Also, new developments in ammunition often required new production processes and equipment. Bridging the technology gap was a challenging task, particularly in those areas that had no civilian counterpart. There was no industrial counterpart for most of the propellants and explosives and load, assemble and pack manufacturing operations required for munitions.

(U) The management of the PBM Program required consideration of an unusually broad range of technologies. This was often quite surprising to those not familiar with the program, since they tended to associate munitions manufacture with propellants and explosives and simple shell (metal parts) operations. In reality, the production of a single round of ammunition involved processes for manufacturing electronic or fluidic fuzes or high strength composites, conducting laser inspection or automated testing, or implementing highly advanced material handling and packaging techniques. The facility could also use advanced systems to abate pollution, improve safety and health, and conserve energy.

(U) Management of the program included development of the requirements for technology. This was often triggered by product requirements; the types and quantities of munitions required and procured for inventory and produced in the event of mobilization. These requirements were normally revised annually and often included a significant

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number of new items. An analysis was made to see whether the existing production base satisfied these requirements, both from capacity and process standpoints. If no capability existed or capacity had to be increased, a need for process technology may have existed.

(U) Once the need for process technology had been established, a manufacturing technology program was formulated. First, a technology assessment was made taking into account technology requirements, the state-of-the-art, and technology forecasts that included the probability of attaining the desired technology. The resulting technology assessment was used to generate technology guidance covering each specific commodity area and indicated in broad parameters the type of process technology desired. These technology guidance packages became the basis for detailed project proposals and submissions.

(U) Following project submission and prioritization, a computerized time-phased master technology plan was prepared. This plan included all required manufacturing technology projects, both ongoing and for a five year forecast period. Program priorities played a major role in this master plan. Funding limitations precluded the accomplishment of all projects in their earliest year of attainment. A critical evaluation was made of each project to determine relative importance or priority, and consideration was given to the technology project's relationship to a scheduled facility project.

(U) To develop a greater understanding of the total magnitude of the program, Master Plans were required to assure effective management of the program. These plans provided the basic efforts required of this organization to fulfill its total mission requirements. To appreciate this it had to be recognized that any individual project, whether an engineering project or a facilities project, represented several years of effort. A project to be executed in a given fiscal year (e.g., 1980) began four or more years earlier (dependent on MMT effort.)

(U) The key to successful accomplishment of the program was the completion of technology and engineering design work early enough that the final facility design was available one year prior to the year in which the facilities contracts were to be awarded. The availability of the final design at that point in time was a Congressional mandate on our program.

(U) Proper scheduling and planning of the prerequisite engineering were very important to the PM's success. Projects which were crashed consistently caused problems through every step of execution and prove-out. The MMT effort may have represented a few months or years, dependent on the complexity of the engineering required. As previously indicated, the engineering effort was closely managed/monitored by this organization because of its criticality to development of the facility project.

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Organization

(U) The primary organizational elements, i. e., those that reported directly to the Office of the PM did not change during FY 1977. There was one titular change at the division level and several organizational changes below the office/division level during FY 1977.

(U) Early in February 1977, the PM requested¹ that the missions and work loads of all organizations within the PBM office be examined and that he be provided with recommendations for improvement. The study effort was to include provisions for establishing a small group to conduct technology analysis and special studies and recommendations for accommodating the DARCOM imposed reduction in TDA strength from 188 to 183. The results of the study effort were presented to the PM and approved for implementation on 14 April 1977.

(U) The Plant Equipment Package Division was redesignated as the Conventional Munitions and Fuze Division. The accompanying workload realignment did not involve position realignments between the two divisions. To reflect the new work assigned within the division, the Project Execution Branch and the Equipment Technology Branch were redesignated Medium Caliber Branch and Large Caliber Branch, respectively. Other organizational changes included the transfer of the technology analysis function from the Plans and Analysis Branch, Program Management Division to the Technical Support Division (TSD). The energy, environment, and metrication programs were reassigned from TSD to the Special Projects, Chemical and Pyrotechnics Branch, Propellants and Explosives Division, and the Word Processing Center was transferred from TSD to the Administrative Support Office. Also the Joint Conventional Ammunition Program (JCAP) responsibilities were reassigned from the Program Management Division to the Joint Mission Planning Office. The JCAP coordinator position was abolished; therefore, no personnel or positions were transferred in conjunction with the reassignment.

Manpower

(U) The authorized strength of the office at the beginning of the fiscal year was 206 (18 military/188 civilian). But the actual strength at the beginning of the fiscal year was 194 (17 military/177 civilian). Military strength decreased by three during the year. Civilian strength rose from 177 at the beginning of the year to a high of 183 and then gradually declined to 169 at the end of the fiscal year.

¹ CMT 1, DRCPM-PBM, Subj: Reorganization of Work Load in PBM, 24 Mar. 77.

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(U) The two most significant factors associated with the decline in civilian personnel strength was the establishment and staffing of ARRADCOM at this location, and the transfer of several PM organizations to this installation in conjunction with the establishment of the new command. Eighteen civilians transferred from this office to ARRADCOM and ARRADCOM PM organizations during the last nine months of the fiscal year.

(U) During the year, DARCOM imposed a productivity cut of five spaces.² This was followed in June 1977 by an adjustment to both the high grade and average grade ceilings authorized for the office.³ The result of the combined action was to reduce the authorized civilian ceiling from 188 to 183, the FY 1977 high grade ceiling (GS-13 and above) from 93 to 80 and the average grade from 10.90 to 10.67.

(U) The productivity cut and the high grade and average grade ceiling goals for FY 1977 were accomplished through attrition and reassignment as noted in the previous comments on reorganization.

(U) Technical/professional personnel comprised 72 percent of the actual work force while clerical, administrative and support personnel comprised 28 percent of the staff as of 30 September 1977. The technical/professional to clerical, administrative and support comparisons at the beginning of the fiscal year was 78 percent to 22 percent. This change was directly attributable to the relatively short time periods required to replace clerical/administrative losses with a much longer period required to recruit technical/professional personnel. Of the 143 technical/professional personnel, 130 held bachelors degrees and 60 held advanced degrees.

Program Management

(U) Manufacturing Technology. Our requirements for the Manufacturing Methods and Technology Engineering (MMT) effort as of 30 September 1977 are shown on Figure 1 below. The funding profile was based on workload projected for our facilities Modernization Master Plan.

² DRCPT-SA Msg, Subj: Changes in FY 77 Civilian Manpower Program, 21 Jan 77.

³ DRCPT-CP Ltr, Subj: Reduction of Senior Level Positions, 6 Jun 77.

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(U) During this period, DA guidance resulted in a total decrement of \$1,376.4 million in the facilities Modernization Master Plan for FY 1979 through FY 1983. Consequently, this reduction had a direct bearing on the support that would be required from the MMT effort. Therefore, DA, in conjunction with the facilities program reduction, likewise reduced the MMT program by \$44.0 million for the same five years.

(U) Based upon these reductions, a new Modernization Master Plan as well as a new Integrated Engineering Plan (IEP) was to be developed to realign priorities within the new funding constraints. This also is necessary to insure DA that those projects vital to the Army will be accomplished as required.

(U) 1977 DOD Munitions Production Base Modernization Master Plan⁴ The 1977 Plan was the first plan to incorporate a service integrated facilitization program under Single Management (SM). The plan was developed using DOD/service guidance and coordinated closely with service and ARRCOM representatives. The plan was based on future year mobilization requirements and related munitions end items and components to production base facility and equipment needs. It considered the capability of both commercial and Government facilities to support mobilization requirements and delineated those expansion and modernization projects required to meet prescribed levels. The 1977 plan was developed based upon DOD guidance which emphasized four major elements - investment priority, theater alternative, US Force priority and responsive base. The investment priorities were: (1) Expand/modernize the production base to meet current procurements; (2) Expand to that capability required to buy out the Authorized Acquisition Objective (AAO) in five years on a 1-8-5 shift basis (often referred to as the five-year rule); (3) Expand/modernize to that capability required for full mobilization. This was the maximum investment level and was based on the sixth-month requirement (often referred to as the six-month rule). A second principal consideration was the sizing of the base to the higher theater requirement. This was a change from guidance utilized in previous modernization planning, and had a significant effect on theater oriented munitions. All investment priorities were further stratified to meet US requirements first and then Allied requirements. Emphasis was also placed on a rapidly responding base.

(U) The Five-Year Plan funding profile is shown at Figure 2. The dollar values for FY 1979 through FY 1982 were extracted from the FY 1978-FY 1982 Fiscal Year Defense Plan while the FY 1983 figure,

⁴ DOD Munitions Production Base Modernization Master Plan, Mar 77.

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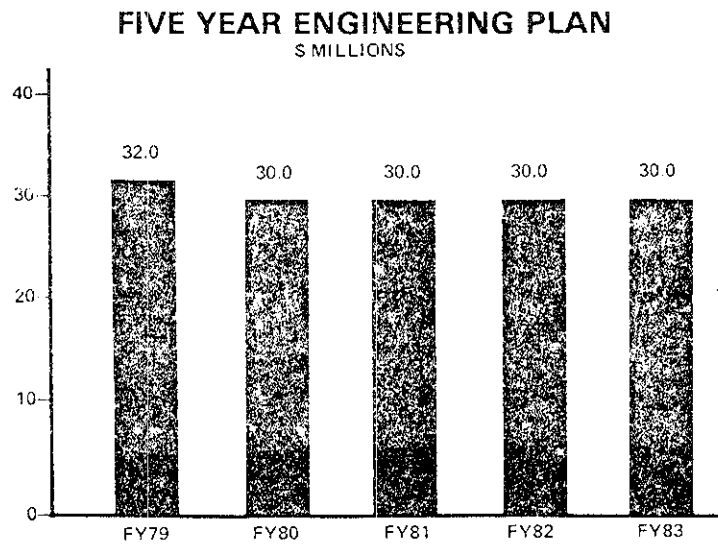


Figure 1

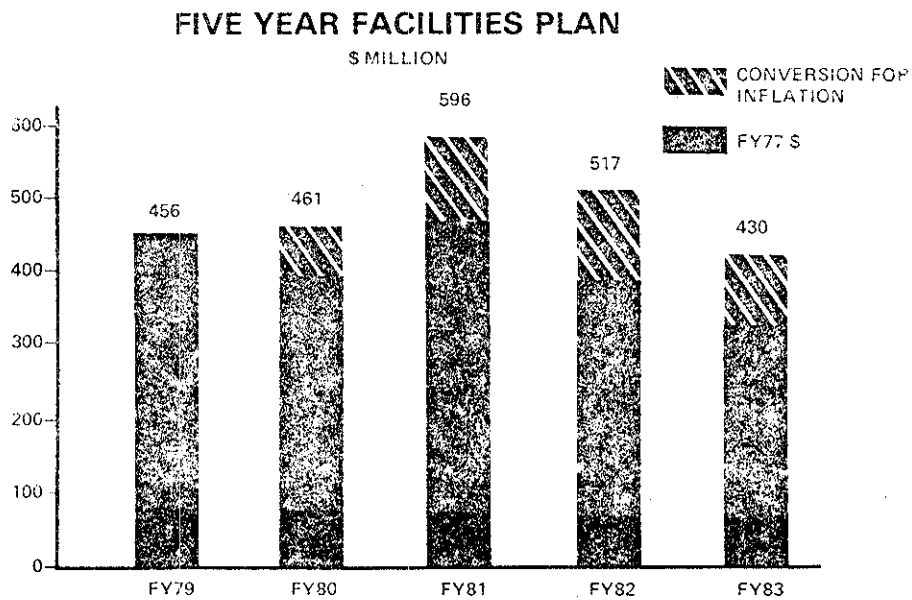


Figure 2

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which was outside the last FYDP planning cycle, was derived from the extended planning annex. In developing the plan, FY 1977 dollars were used for the period beyond FY 1979. Program totals were shown at the top of the bar for FY 1980 - FY 1983 (FY 1977 dollars), and when inflated, convert to the five-year guidance figures. The FY 1979 total was in FY 1979 dollars.

(U) SM responsibility was fully recognized in developing the 1977 Plan. Compared with the 1975 program, the planning guidance changed significantly. The program was an increased program, principally driven by increased requirements and many new items coming out of development. Also, the funding profile was a reduced profile, which had the effect of extending the plan. Lastly, this program definitized the plant equipment package program which was being updated and modernized.

(U) Program. The FY 1977 program at the end of the fiscal year was comprised of 22 facility projects (released) valued at \$173,626,000 and 48 MMT projects (released) for \$25,348,000, or a total of \$198,974,000.

(U) At the end of the fiscal year 85.9 percent of the FY 1977 Program was obligated and 69.5 percent awarded. The break out was as follows:

| | <u>OBLIGATIONS</u> | <u>AWARDS</u> |
|------------|--------------------|---------------|
| MMT | \$ 21,283,000 | \$ 21,283,000 |
| Facilities | 149,663,000 | 117,029,000 |
| Total | 170,946,000 | 138,312,000 |

(U) Total obligations and awards accomplished during the fiscal year (FY 1977 Program and prior years carryover) were as follows:

| | <u>RELEASED PROGRAM</u> | <u>OBLIGATIONS</u> | <u>AWARDS</u> |
|------------|-----------------------------|--------------------|---------------|
| MMT | \$ 25,847,000 | \$ 23,617,000 | \$ 23,617,000 |
| Facilities | 189,838,000 | 188,988,000 | 198,697,000 |
| Total | 215,685,000 | 212,605,000 | 222,314,000 |

(U) A program performance summary is at Figure 3.

(U) During the year, 32 facility projects valued at \$41.9 million and 40 MMT projects valued at \$16.7 million were physically completed. Charts showing yearly completion summaries are at Figures 4 and 5.

(U) O&MA Funds. The internal operating budget of Production Base Modernization (PBM) was supported solely through O&MA funding. A profile of the O&MA program indicating actual data for FY 1976 is at Figure 6.

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PROGRAM PERFORMANCE
\$ MILLIONS

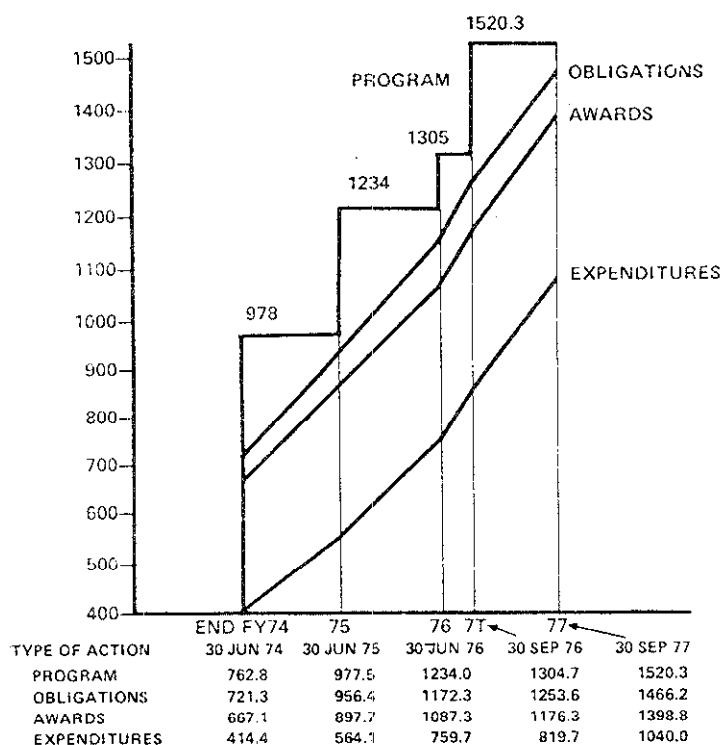


Figure 3

FACILITIES SUMMARY

| FY | NUMBER OF PROJECTS | NUMBER OF PROJECTS COMPLETED | \$ PROJECTS COMPLETE | SPT | EXP | MOD | TOTAL* | RELEASED | OBLIGATED | AWARDED | EXPENDED |
|-------|--------------------|------------------------------|----------------------|-------|--------|--------|--------|----------|-----------|---------|----------|
| 70 | 51 | 49 | 199.7 | 1.7 | 1.0 | 201.3 | 204.0 | 204.0 | 204.0 | 203.8 | 202.1 |
| 71 | 27 | 18 | 40.5 | 5.1 | 2.2 | 121.1 | 128.4 | 128.4 | 127.5 | 123.9 | 115.0 |
| 72 | 31 | 25 | 73.9 | 3.8 | 1.0 | 112.3 | 117.1 | 117.1 | 117.1 | 114.6 | 111.2 |
| 73 | 35 | 24 | 28.3 | 8.6 | 8.6 | 91.7 | 108.9 | 108.9 | 108.4 | 107.2 | 97.1 |
| 74 | 32 | 20 | 22.9 | 8.9 | 91.1 | 25.6 | 125.6 | 125.6 | 123.2 | 122.4 | 103.0 |
| 75 | 28 | 15 | 11.5 | 7.4 | 107.2 | 125.9 | 240.5 | 240.5 | 234.0 | 227.7 | 136.7 |
| 76 | 40 | 8 | 3.1 | 3.7 | 72.8 | 83.3 | 159.8 | 138.1 | 130.5 | 122.8 | 65.4 |
| 7T | 12 | 0 | 0 | 4.5 | 5.8 | 133.8 | 144.1 | 55.3 | 47.8 | 35.3 | 9.7 |
| 77 | 23 | 0 | 0 | 0 | 112.0 | 69.1 | 181.1 | 173.6 | 149.7 | 117.1 | 9.5 |
| 78 | 25 | 0 | 0 | 7.0 | 223.1 | 67.5 | 297.6 | 0 | 0 | 0 | 0 |
| 79-97 | 425 | 0 | 0 | 414.3 | 4677.9 | 2223.8 | 7316.0 | 0 | 0 | 0 | 0 |
| TOTAL | 729 | 159 | 379.9 | 465.0 | 5302.7 | 3255.4 | 9023.1 | 1291.5 | 1242.2 | 1174.8 | 852.7 |

* EXCLUDES COE OMNIBUS

Figure 4

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MT SUMMARY

| FY | PA | | FA | | EA | | HDL | | TOTAL | | TOTAL | |
|-------|-------------|-------|-------------|------|-------------|------|-------------|-----|-------------|-------|-----------|-------|
| | NO. OF PROJ | \$ | NO. OF PROJ | \$ | NO. OF PROJ | \$ | NO. OF PROJ | \$ | NO. OF PROJ | \$ | PROJ COMP | \$ |
| 70 | 15 | 3.9 | 5 | 3.3 | 2 | 8.3 | 0 | 0 | 27 | 15.5 | 22 | 15.5 |
| 71 | 22 | 9.3 | 5 | 4.2 | 2 | 2.9 | 0 | 0 | 29 | 16.4 | 29 | 16.4 |
| 72 | 17 | 14.5 | 7 | 6.1 | 1 | 4 | 0 | 0 | 25 | 21.0 | 23 | 19.9 |
| 73 | 38 | 25.7 | 14 | 7.3 | 6 | 1.8 | 1 | .3 | 59 | 35.1 | 54 | 23.1 |
| 74 | 43 | 24.9 | 20 | 9.8 | 4 | 2.5 | 3 | .6 | 70 | 37.8 | 48 | 15.6 |
| 75 | 30 | 20.9 | 13 | 8.6 | 5 | 5.5 | 3 | .6 | 51 | 35.8 | 24 | 11.6 |
| 76 | 36 | 22.7 | 16 | 7.9 | 5 | 4.3 | 4 | .9 | 61 | 35.8 | 5 | 1.5 |
| 77 | 16 | 4.6 | 1 | 1.3 | 2 | .4 | 2 | .1 | 21 | 6.4 | 2 | .5 |
| 77 | 31 | 16.3 | 11 | 7.3 | 3 | 1.0 | 3 | .7 | 48 | 25.3 | 0 | 0 |
| 78 | 29 | 16.2 | 15 | 8.3 | 0 | 0 | 2 | .8 | 46 | 25.3 | 0 | 0 |
| TOTAL | 277 | 159.0 | 107 | 64.1 | 30 | 27.1 | 18 | 4.0 | 432 | 254.2 | 207 | 104.3 |

Figure 5

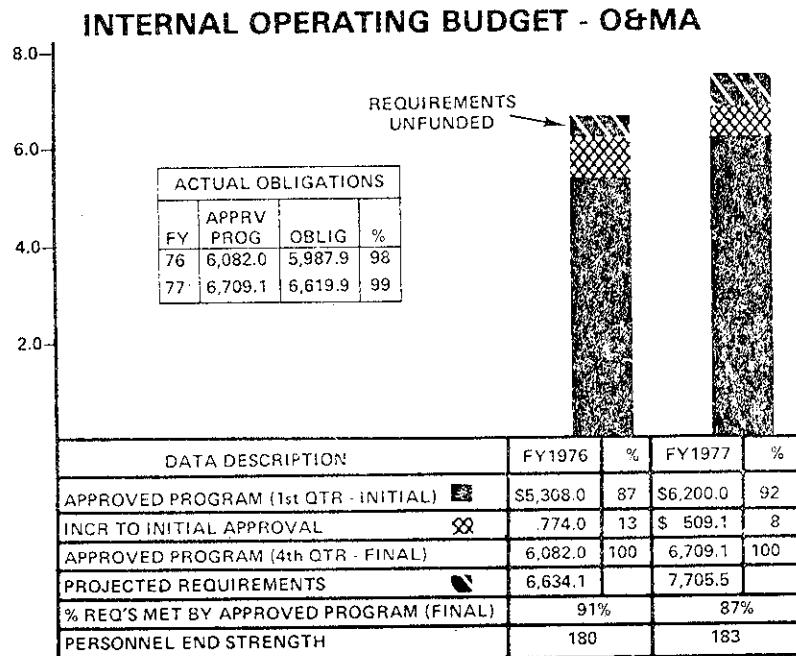


Figure 6

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The FY 1977 program is summarized as follows:

| <u>Budget Activity</u> | <u>FY 1977 Obligations</u> | <u>FY 1977 Funded Program</u> | <u>Percent Funded Prgm Obligated</u> |
|------------------------|--------------------------------|---------------------------------------|--|
| Salary & Wage | \$4,242,000 | \$4,265,000 | 99 |
| Personnel Benefits | 392,400 | 400,000 | 98 |
| Host/Tenant Agreement | 992,200 | 995,000 | 100 |
| Other | <u>993,300</u> | <u>1,049,100</u> | <u>95</u> |
| Total O&MA Program | \$6,619,900 | \$ 6,709,100 | 99 |

Other - Delineated

| | | | |
|--------------------------|----------------|----------------|-----------|
| Transportation of Things | \$ 4,700 | \$ 5,200 | 90 |
| Supplies | 6,400 | 12,700 | 50 |
| Contractual Services | 19,600 | 21,000 | 93 |
| Training | 38,200 | 40,000 | 96 |
| Equipment Maintenance | 1,300 | 2,000 | 65 |
| Equipment Buy | 49,900 | 58,800 | 85 |
| Equipment Rental | 65,500 | 68,900 | 95 |
| Travel | 386,000 | 412,300 | 94 |
| AIF Purchases | <u>421,700</u> | <u>428,200</u> | <u>98</u> |
| Total Other | \$ 993,300 | \$ 1,049,100 | 95 |

| <u>Budget Activity</u> | <u>FY 1977 Obligations</u> | <u>FY 1977 Funded Program</u> | <u>Percent Funded Pgm Obligated</u> |
|------------------------|--------------------------------|---------------------------------------|---|
|------------------------|--------------------------------|---------------------------------------|---|

AIF Purchased Services - Delineated

| | | | |
|------------------------------|----------------|----------------|------------|
| Communications | 17,700 | 30,000 | 59 |
| Shared Time Computer | 77,600 | 70,000 | 111 |
| Facilities Services | 27,000 | 35,000 | 77 |
| Graphic Arts Services | <u>299,400</u> | <u>293,200</u> | <u>102</u> |
| Total AIF Purchased Services | \$ 421,700 | \$ 428,200 | 98 |

(U) FY 1977 year end balances from the DARCOM approved O&MA budget program of \$6,709,100 is summarized as follows:

| | <u>AIF</u> | <u>NAIF</u> | <u>Total O&MA Budget Pgm</u> |
|------------|--------------------|--------------------------|--------------------------------------|
| Obligated | \$1,423,200 | Pgm \$5,285,900 | \$6,709,100 Pgm |
| Expended | <u>(1,413,900)</u> | Oblig <u>(5,206,000)</u> | <u>(6,619,900)</u> Used |
| Unexpended | 9,300 | Unoblig 79,900 | 89,200 Unused |

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(U) Omnibus Engineering Program. Omnibus engineering funds are provided to plants/other government agencies; i.e., Harry Diamond Laboratory (HDL), ARRADCOM, US Navy facilities, and commercial plants, to accomplish preliminary work for future year projects prior to approval and availability of project funds.

(U) Project 5773046 was authorized for \$10.3 million of which \$10.2 million was issued to plants, US Navy and ARRADCOM in support of FY 1978, FY 1979, FY 1980 projects. Funds issued to ARRADCOM were utilized to support PBM activities both in engineering and quality assurance areas as well as Huntsville Division for special studies in support of the Modernization/Expansion Program.

FY 1977 Omnibus Engineering Program

Authorized: \$10,294,028.00
Issued: 10,201,737.97
Balance: 92,290.03

Distribution -

| | |
|---------------------|-----------------|
| ARRADCOM | \$4,178,085.66 |
| Badger AAP | 81,334.00 |
| Frankford Ars | 459,000.00 |
| Hawthorne AAP | 15,000.00 |
| Harry Diamond Lab | 150,000.00 |
| Holston AAP | 10,000.00 |
| Huntsville Div Engr | 760,000.00 |
| Indiana AAP | 414,723.00 |
| Iowa AAP | 1,196,052.17 |
| Joliet AAP | 2,500.00 |
| Kansas AAP | 111,053.00 |
| Lone Star AAP | 635,981.14 |
| Longhorn AAP | 50,000.00 |
| Milan AAP | 129,978.00 |
| Pine Bluff Ars | 173,000.00 |
| Radford AAP | 791,640.00 |
| Sunflower AAP | 382,400.00 |
| Civil Engr Lab | 5,000.00 |
| US Navy | 605,991.00 |
| ARRCOM (CPFX) | 50,000.00 |
| Total | \$10,201,737.97 |

(U) Obligations. With the high level of visibility given to FY 1978 obligations by the PM and higher headquarters, a procedure had been developed to track the preparation, approval and submission of the Scopes of Work (SOW) to the contracting officer; the release and

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transmittal of funds to the contracting officer; and the solicitation and award of a contract/modification by the contracting officer. By use of the Advance Procurement Milestone Charts, an obligation date was forecast based on the availability of the SOW and funds. Their milestone charts were updated monthly and changes to the baselined forecast highlighted. A monthly summary was prepared for the PM.

(U) Cost/Schedule Control Systems Criteria. CS₂ applications were expanded during FY 1977 to include the Louisiana Army Ammunition Plant (AAP), for a total of seven Government owned, contractor operated (GOCO) AAP's. The Mississippi AAP is scheduled for validation during FY 1978.

(U) Surveillance Reviews, also known as Plant Assistance Visits, were expanded to cover all validated plants. These visits ensure that operating contractors continue to comply with the management information systems for which they receive validation, and that Government personnel (Contracting Officer's Representative (COREP) staff) were implementing approved Surveillance Plans on a timely basis.

(U) The Uniform Cost Accounting and Reporting System (UCARS). UCARS was designed for the purpose of enabling valid comparisons between unit production costs at the various GOCO plants. Initially implemented at the Kansas AAP in October 1976, it was soon discovered that UCARS increased the total cost of non-production activities, particularly those which were labor intensive, such as MMT and lay-away projects. In theory, this shift in costs should have no impact since the total cost to the plant remains the same. In actuality, however, there is no known way to trade off production for non-production dollars unless they are "same year" dollars and the need for additional funds is recognized before the production dollars are exhausted.

(U) Since the impact on the Production Base Modernization (PBM) was relatively modest at Kansas AAP (approximately \$50,000), the potential magnitude of the problem was not fully recognized until UCARS was implemented at Radford and Milan AAP's (January 1977), Holston AAP (April 1977) and Indiana AAP (July 1977). Although precise data were not available, there were indications that the cost growths on non-production orders ranged from 10 to 15 percent UCARS applied to all on-going orders as of the date of the implementation. Accordingly, almost automatic cost overruns could be anticipated until FY 1980, the first year for which apportionment P-15's, 16's, and 17's was to be costed on the basis of UCARS.

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(U) Erosion of project dollars had been further exacerbated by interpreting Cost Accounting Standards (CAS) in a manner which made no distinction between production and non-production sales orders for purposes of distributing indirect expenses. (This dialogue was continuing between DARCOM and PBM).

(U) The Cost Accounting Standards (CAS). In 1970 Congress passed Public Law 91-379. This law established a Cost Accounting Standards Board (CASB) tasked with achieving uniformity and consistency in cost accounting principles used by defense contractors and subcontractors. It was not until 1976, however, that a ruling was furnished that the GOCO plants are subject to the standards.

(U) Unfortunately from the PBM point of view, the Standards were interpreted by some, but not all, (DCAA) Defense Contract Audit Agency resident auditors as eliminating the distinction between the production mission and the non-production capital investment activities. As noted in the preceeding discussion of UCARS, the result had been a serious erosion of PBM funds and/or the deletion of significant portions of SOW's. PBM intended to continue its efforts to establish that the GOCO plants were a unique environment requiring special rules to achieve equitability, but the ultimate outcome could not have been forecast at the end of this period.

Technical Support Division

(U) Configuration Management (CM). During this period the CM element of the Technical Support Division experienced an increased workload, assignment of additional responsibilities, and an increase in personnel strength.

(U) Eleven PM Configuration Control Board (CCB) meetings were held and 554 Engineering Change Proposals (ECP's) were considered; 424 change CCP's and 130 baseline ECP's comprised that total. This translated to approximately 50 ECP's considered at each CCB meeting.

(U) During January 1977 the report of the ARRADCOM Tables of Distribution/Configuration Management System (TD/CMS) Task Team was staffed, reviewed, and accepted for implementation. Also, a study was conducted on the possible resurrection of Descriptions of Manufacture for preparation and inclusion into Modernization and Expansion Project Operational Baselines. It was recommended and accepted that the Description of Manufacture not be resurrected but instead that pertinent additional data be incorporated into operational baselines. During this time preliminary data input to TD/CMS was initiated. These data were extracted from ECP's and management information from the RDX/HMX Project.

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(U) During March "as built" drawings were microfilmed and incorporated into TD/CMS. Microfilm aperture cards were filed and distributed as part of the Engineering Data Micro-Reproduction System (EDMS). ARRADCOM provided EDMS support services. The Rockwell International TD-CMS contract was completed and it provided a dedicated TD/CMS application for modernization and expansion projects. Also, a review of interface systems was conducted. The Interface Definition Plan developed by the USAEDH (US Army Engineering Division, Huntsville), was recommended for use and was established as the pilot application. USAEDH was funded to provide a generalized plan, suitable for tailoring, for modernization and expansion projects.

(U) An ECP transmittal letter providing implementation authority and funding instructions was developed and used. Personnel from the CM element were assigned to, and actively participated in, the DOD Configuration Management Standardization effort directed by DARCOM and the JCAP Technical Data/Configuration Management Task Group. A close liaison was also maintained with ARRADCOM and the RDX/HMX project office in the development of TD/CMS and system engineering. The RDX/HMX project was subsequently designated the pilot for both applications and the CM element participated actively in the effort.

(U) In May 1977 action was initiated with USAEDH to improve the quality of "as built" drawings. Many drawings were substandard and not suitable for microfilming.

(U) Additional effort was expended in the system engineering area during May and June 1977 and several briefings were presented. As a result, the responsibility for Systems Engineering Management was assigned to the CM element in August 1977. The Deputy PM desired that a system engineering program be developed that would be suitable for tailoring to individual projects and not constitute a major inhouse program requiring additional staffing.

(U) During August, data management focal points were established in each engineering division. This was required to cope with the expanding and changing workload relating to SOW's and CDRL's, DD Form 1423. Additional instructions on CDRL preparation were prepared and distributed. A close working liaison was maintained with the Procurement and Cost Analysis Branch of PMD in the SOW area. The CM element was charged with reviewing each SOW and approving each related CDRL. This created a heavy workload and also entailed a close working relationship with ARRCOM. A program of CM audits was initiated during August and the first project audited was the Lone Star AAP Modernization of the Detonator Facility.

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(U) Product Assurance. During this fiscal year normal activities; i.e., monitoring individual project product assurance activities, reviewing SOW's, specifications, product assurance plans, test specifications, test plans; providing staff guidance and assistance to operating divisions, etc., were satisfactorily performed.

(U) Prove-Out Plan 702-2, published in September 1976, was distributed to 211 participating PBM organizations on 10 November 1976. The plan was briefed to GOCO commanders at the December 1976 ARRCOM Commanders' Conference at Rock Island. The plan provided a formal procedure for accepting PBM equipment and transferring it to ARRCOM. In the past, equipment was acquired and laid away without adequate testing. A separate means of funding was established since the PM could no longer rely on current production to test PBM equipment/system.

(U) To place greater emphasis upon inclusion of appropriate product assurance and prove out activities during the life of a project, ten new milestones were included in the 101 report. Project engineers were then responsible for these activities, and workload increased considerably in providing assistance to accomplish these activities. ARRCOM Procurement Assurance Directorate continued to provide Reliability, Availability and Maintainability (RAM) training seminars to those AAP's requiring assistance in implementing a RAM program (Milan and Lone Star). A draft training RAM handbook was completed by the University of Texas A&M. The draft was being reviewed by various individuals prior to publication.

(U) Greater product assurance participation in plant modernization was actively pursued by ARRCOM Product Assurance (PA). Greater emphasis was placed upon timely preparation of product assurance plans, demonstration test specifications and demonstration test plans; also providing instructions to AAP's for data collection during the demonstration test and monitoring of the test.

(U) More RAM programs were included in facilities projects this year, and contractors were obtaining the services of outside consultants to accomplish these programs. A system analysis document was developed to provide guidance to the system engineering contractor in evaluating and optimizing a system design.

(U) The following special studies were conducted to evaluate how well we were accomplishing prove out and applying RAM:

| <u>Study Title</u> | <u>Organization</u> |
|--|---------------------|
| Evaluation and Improvement of the Prove Out Process (Rpt dtd May 77) | Gourary Associated |

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| <u>Study Title</u> | <u>Organization</u> |
|---|---------------------|
| Study of Prove Out Plan 702-2 (Rpt dtd Dec 1977) | AMSAA |
| Technical Guide for RAM (Rpt dtd Jul 1977) | Richard M. Jacobs |

(U) During this period, the effort started to utilize data from prove out for follow-on facilities and design and procurement of new facilities. As a result of the successful prove out of Joliet (TNT) trinitrotoluene, Line 16, changes were to be incorporated into follow-on lines at Joliet without additional prove out. Data from Kansas and Lone Star AAP's M483 LAP prove out was collected and used to evaluate the technical data package (TDP) for the follow-on line at Milan AAP (Project 5783506).

(U) An ad hoc team was established (consisting of members from PBM, ARRADCOM and ARRCOM) to investigate GOCO plant product assurance support to the PBM program completed their study. Their report was in final preparation and was to be forwarded to Commanders of ARRADCOM and ARRCOM.

(U) Special services in the area of operations research were provided to the PBM engineering divisions. Arrangements were made with ARRADCOM PAD to accomplish computer simulations, to test the designs for the following projects: 3142 - M42/M46 Grenade MPTS Final Inspection and Tape Maker for Fuze Assy System (M223); 5793590 - LAP 105mm, Lone Star; 5793506 - Milan, 8", M509.

During this fiscal year this office became actively involved in the Materials Testing Technology Program. It currently supported 13 projects in the FY 1977 and FY 1978 time frames and was considering 15 for FY 1979.

(U) To keep abreast of ARRADCOM PAD support to the programs, periodic reviews of individual project accomplishment were instituted. These reviews were to become standard procedure.

(U) Technical Analysis. The Technical Analysis Group was formed in April 1977, to direct the Manufacturing Methods and Technology Engineering (MMT) Program, coordinate and direct the PM study efforts, and to provide guidance and formulate policy for process control systems for PBM.

(U) Studies. During the reporting period, BG Egbert directed that a central repository of PBM-sponsored studies be established. These studies often provided vital information. However, the information provided was sometimes limited to the office/division immediately

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involved with the study, and this lack of dissemination could lead to a duplication of effort or a lack of data for other groups. The purpose of gathering these study reports was to publish a report index to facilitate dissemination of the data.

(U) Manufacturing Technology Advisory Group. Support to the DOD Manufacturing Technology Advisory Group (MTAG) was increased significantly by the appointment of Mr. Pritchard of PBM to the position of Munitions Subcommittee Chairman, and the more active involvement by PBM personnel.

(U) The Munitions Subcommittee was one of the six specialized committees of MTAG. Involved with tri-service coordination of the full spectrum of munitions manufacture, it also maintained close liaison with industry, academia and other areas of manufacturing technology. Subcommittee membership from the three Services represented an unusually broad range of expertise, necessitated by the highly diverse technology areas of munitions. The subcommittee was reorganized into five process oriented subgroups, with PBM personnel assuming subgroup leadership in the areas of energetic assembly and component processing. Additional personnel from PBM support the munitions and other MTAG subcommittees.

(U) Two areas which the subcommittee concentrated on in the past year were industry involvement and technology transfer. Industry involvement was strengthened by meeting with representatives of the American Chemical Society and American Institute of Chemical Engineers. Both groups pledged their support to strengthening DOD-industry coordination. Technology transfer was increased by the issuance of "The MAN-TECH Journal" by AMMRC. The first issue featured munitions production technology and was highlighted by six articles written by PBM personnel.

(U) Process Control Training. The first phase of a process control system training program was initiated in April 1977. Dr. Malcolm Beaverstock, of the Foxboro Company, presented a seminar to PBM personnel in which he presented the problems and pitfalls of PCS design. These were illustrated by application examples from his own experience. The major emphasis of this seminar was the manager's role in PCS design.

(U) To improve control system support effectiveness, this office coordinated the development of the first two chapters of a control system design handbook. The first chapter was entitled "PCS Functional Criteria Development Manual." These guidelines were to be applied to two projects, CAMBL and RDX/HMX as initial demonstration examples of this new guidance manual.

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(U) The National Bureau of Standards was awarded a contract through ARRADCOM to develop engineering guidelines for PCS development. These guidelines were to be a second chapter in PCS design handbook. The final draft of these guidelines was to have been completed in June 1978.

(U) PCS Layaway. A workshop, sponsored by the National Bureau of Standards, was held at Purdue University to identify the PCS layaway problem. Dr. Ted Williams, an expert in the control system field, invited experts from industry, academia and vendor companies. Personnel from government agencies were also invited to discuss relevant layaway procedures and past experience. Those attending the workshop formulated recommendations for computer hardware and software, other process control equipment and personnel. These recommendations and the position papers were to be published in a National Bureau of Standards publication in May 1978.

(U) Safety/Security. Mr. Drugmand, a PBM Safety Engineer, developed a system safety program which was specifically oriented to the needs of the Modernization and Expansion Program. This program was implemented chiefly through hazard analyses associated with each project. It established definitions, statistical guidelines, documentation and scheduling requirements for each project's hazard analysis. This program was necessary to implement the requirements of MIL-STD-882A, and because ARMCOR 385-4 did not provide the system safety requirements in the detail and specificity required for modernization and expansion projects.

(U) The system safety program was explained in Addendum I to DRCPM-PBMM 385-3. The requirements of the system safety program were further tailored to the needs of each project in order to meet each project's unique needs. This system safety program was expected to be cost effective, i.e., save more money through cost avoidance than what it cost to implement. It was expected to improve the safety performance of projects by systematically analyzing the safety aspects to identify hazards and direct the most safety effective changes within cost and time constraints. The most safety effective changes were those which had the least severe potential accidents and/or lowest probability of accidents occurring. The system safety program used the proven safety record of DARCOM as the minimum performance requirement.

Value Engineering

(U) During this reporting period this office was reduced to a one man shop by the retirement of its chief. The problems that this created are not apparent; however, a large backlog of pending work resulted.

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An example of the backlog was in the area of Engineering Change Proposals. Before the office was reduced to one man, the VE office reviewed and commented on all ECP's and actively participated in the Configuration Control Board meetings conducted by the APM. This effort was curtailed.

(U) In March 1977, DARCOM, for the first time, assigned a VE goal to PBM. However, due to late assignment of the goal, some problems in reporting and formation of the new Armament Command, it was not achieved.

(U) The FY 1978 goal was assigned in October 1977 and it was felt that this goal was met as follows: (1) Carryover from FY 1977 (approved but not certified); (2) The Armament Commands accepted a sub-assignment equal to 25 percent of our goal; (3) This office awarded four third-party contracts, and the results were to lead to VE action; (4) Value Engineering Funded Studies were to lead to VE actions; (5) VE reviews were funded at individual GOCO's and the results were to be VE actions; (6) ARRCOM was going to implement guidance from this office in early 1978 that was to have led to VE reviews and reports being presented with each baseline under consideration by the CCB.

Propellants and Explosives Division

(U) Facility Project Activity (Explosives). Efforts were continued to complete and close out prior year projects which related to production and support facilities for explosives. During this period, several prove-out projects on modernized TNT lines were successfully completed by water and/or live test at Joliet and Volunteer AAP's.

(U) Highlights of activities on projects under design, construction and prove-out during the FY 1977 period are as follows:

Specification TNT was produced at Joliet AAP on Line #16 (Project 5722139) using the DDC system. Modifications to Lines 17 and 18 at Joliet, also under DDC were being accomplished under an FY 1978 project which was to place all TNT lines in operable status at Joliet.

At Volunteer AAP, two projects, 5702418, Water Test of TNT Line 2, and Project 5792419, Modifications of the ILWTF, were active. The design modifications of the ILWTF were prepared by outside consultants.

Under Project 5755901, Restoration of Radford AAP plant TNT lines B&C was progressing smoothly. The CE and

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DARCOM portions were on schedule with estimated completion date expected by June 1979. After mechanical check out and debugging, a live production test was planned in the Fall of 1979.

Additional difficulties were encountered in prove-out test of the 300 ton per day nitric acid production facility, Project 5765902, at Holston AAP. A leak which developed in the nitric oxide (NO_x) compressor unit was corrected; however, in subsequent prove-out another leak was discovered in the waste heat boiler which caused NO_x emissions to narrowly miss meeting emissions standards. Completion of repairs to this equipment was expected by September 1978.

Under Project 5782135 at Joliet AAP, an execution plan was completed to place the required waste treatment facility in operating condition. The facility was being disassembled and inspected to determine the extent of the required work and associated cost.

For Holston AAP, Project 57T2664, administration building, a Corps working estimate on final design for construction of a new building, as compared with updated estimates for renovation of the existing building was developed. Construction of a new building was recommended as the preferred alternative.

With regard to Project 5762068 at Holston AAP, on prove-out of the continuous Comp B line #1, operation and test of all units in the line, which were constructed under three MMT projects, uncovered a severe dust problem in the continuous drying of A-7 explosives. This project was undergoing extensive reevaluation by outside consultants as well as Government technical personnel.

Construction of the \$103 million nitroguanidine plant at Sunflower AAP, Desota, Kansas was progressing smoothly. At this time the sole source producer of nitroguanidine was Cyanamide of Canada. The plant at Sunflower was to be the first US facility. Construction of the basic nitroguanidine line is 93 percent complete including the railroad and electrical distribution systems. The outside boilerhouse coal yard and ash sluice lagoon was 99 percent complete, and the interior boilerhouse rehabilitation was 83 percent complete. Contractual execution efforts for the calcium cyanamide, sulfuric acid concentrator, and nitroguanidine support equipment were 10 percent complete.

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(U) MMT Project Activity (Explosives). Work continued on 17 MMT projects during the period to improve manufacturing technology relating to improved and/or new process equipment for explosives compositions A-3, A-4 and A-5. Outside consultants were engaged to assist in resolving the severe dusting problems encountered. Satisfactory progress was being made on other projects.

(U) Nitroglycerin Plant. At Badger AAP a continuous Biazzi nitroglycerin plant rated at 2500 lbs/hr was completed and successfully subjected to an inert prove-out. Minor difficulties were encountered with the support systems and action was in progress to resolve these difficulties. An inert prove-out was used since Badger AAP was in layaway and any nitroglycerin produced in a live prove-out would have posed a major disposal problem.

(U) Black Powder Plant. At Indiana AAP a 500,000 lb/mo black powder facility was completed. The plant, which cost \$30 million, was the first ever built for military production at a GOCO installation. There was only one commercial producer and that plant had a limited future. The Indiana plant was remotely operated and automatically controlled by a computer system. It had sufficient capacity to satisfy mobilization requirements for all grades of black powder, fuze powder and propellant composition. Prove-out was scheduled for CY 1979.

(U) Radford AAP Support Building. At Radford AAP a new receiving, inspection and shipping building was completed in the support facilities program. This facility combined in a single centrally located building operations which were previously conducted in a number of scattered units. It was strategically located so that deliveries and pickups could be made without entering areas where hazardous activities were in progress.

(U) Facility Project Activity (Propellants). Major emphasis was placed on completing the acid plant construction that had been formerly under the Chemico contract. When the FY 1971 and prior year suspension of payments edict was issued in November 1975, Chemico claimed termination for the benefit of the Government and withdrew from the acid construction work at Badger, Radford and Sunflower AAP's. After the lifting of the suspension of payments, the CE negotiated new contracts for project completion. Acid plants in Radford and Sunflower were being completed by the operating contractor, Hercules, Inc. At Badger AAP, Stearns-Roger, Inc. of Denver, Colorado was awarded a contract for completion and prove-out performance testing of the Chemico acid plants. The nitric acid-sulfuric acid concentrators were completed at Sunflower AAP, and debugging of the facilities was begun in preparation for performance testing. At Radford AAP, the nitric acid-sulfuric acid concentrators were nearing mechanical

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completion. Prove-out of these units was scheduled in mid-1978. At Badger AAP, Stearns-Roger concentrated on completing repairs to the sulfuric acid regeneration facility which was damaged in the early prove-out phase in FY 1977. Performance testing of this unit was also scheduled for mid-1978. Following this effort, attention was to have been focused on completing the ammonia oxidation plants at Badger and Sunflower AAP's. Finally, Stearns-Roger was to have completed the nitric acid-sulfuric acid concentrators at Badger AAP.

(U) At Radford AAP molecular sieves for pollution abatement of the nitrogen oxides were installed on the two continuous nitration units for manufacturing nitrocellulose. Attempts to use the molecular sieve for the first nitrocellulose unit resulted in serious damage to some of the auxiliary equipment attached to the molecular sieve. The cause of the damage was attributed to incorrect materials of construction. Repairs were in progress and effort was focused on completion of the second nitrocellulose unit as well. A project funded in FY 1975 for construction of a nitrocellulose thermal dehydration unit was nearing completion. This unit was to have been operating in mid-1978 to support current production orders.

(U) At Sunflower AAP, prior projects for a two million lb/mo continuous solventless paste and mechanized roll facility were nearing completion. In November 1976, the construction effort was accepted with noted deficiencies. Installation of operating equipment then proceeded for the rest of the fiscal year. Prove-out of these facilities was scheduled in 1978.

(U) The construction of a continuous automated single base line at Radford AAP was nearing completion. Because of the changes in current production orders, it was decided to provide the line with an 8" M1 production capability in addition to the previous 155mm M1 and 175mm M6 capabilities. The demonstration test specification for prove-out of this line had been baselined and the early phases of preparation of prove-out was to be underway soon.

(U) Fiscal Year 1977 saw the approval of two new facilities projects for the Propellants Branch. At Sunflower AAP, a project was approved for a sulfuric acid regeneration plant. Planning and design were initiated for a two step procurement effort; however, the procurement was altered from two step formal advertising to a negotiated procurement when only one bidder responded to the request for technical proposal. Negotiations between the HND and the bidder were in progress. A second project approved was for the establishment of an Initial Production Facility (IPF) for the manufacture of carbbrane. A contract was awarded in September 1977 to Callery Chemical Company, Callery, Pennsylvania. The carborane process equipment to be provided with Government funding was to be severable.

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Carborane was a necessary burning rate additive used in the VIPER weapon system. The facility was under construction and was to cost approximately \$5 million.

(U) During FY 1977, a number of designs were completed for facilities in the FY 1978 and beyond fiscal periods. Facilities for the production of the 155mm and 8" rocket assisted projectile propellant grains were designed for Radford AAP. Designs were also completed for a new boiler feedwater system and a replacement fire alarm system at Radford AAP. Final designs were available for a new consolidated lab at Radford and for the third continuous nitrocellulose unit. Construction design was completed for Sunflower AAP igloo storage magazines to house the output of the new nitroguanidine plant.

(U) Design effort was underway for a number of other facilities. At Badger AAP, facility design was in progress for a semi-automated single base line and for the first nitrocellulose unit. Plans were underway to expand the carborane IPF facility at Callery to produce sufficient carborane to meet mobilization requirements. An IPF for SLU-FAE rocket motors was under design at Indian Head Naval Ordnance Station, Indian Head, Maryland. This facility was to be capable of meeting Five Year Defense Plan buys through FY 1981. An FY 1980 expansion project is planned for Longhorn AAP.

(U) The design effort for the continuous automated multi-base line (hybrid) facilities at Radford and Sunflower AAP's was on schedule. Catalytic, Inc., was the construction architect/engineer (A&E) for new technology portions (green lines) at both sites. Zurhide-Hermann and R. W. Booker were designing the rehabilitation of the finishing areas at Radford and Sunflower, respectively. Concept designs were initiated in late FY 1977 and final designs were scheduled for completion in the 4th Quarter, FY 1978. Hercules, Inc. was handling the process equipment design and initiated this effort in FY 1977. In order to assure effective management control of the multi-base projects, a multi-base propellant production team was established at PBM to manage both the MMT and facilities projects and coordinate the efforts of the various organizations involved in the design activity. Good management control was being effected through frequent design review meetings, the establishment of a construction/process interface committee and the application of configuration control procedures to facility design. Lessons learned and experience gained on prior year projects were being continuously applied.

(U) Propellants Briefings. A number of briefings were presented during FY 1977 in support of the facilities program. A basic briefing on multi-base projects was presented to the PM in November 1976.

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Additional briefings on the review of the multi-base program were presented in January 1977 and August 1977. In December 1976, the status of the Badger sulfuric acid regeneration facility prove out/ acceptance was briefed to the Commander, ARMCOM. Also in December 1976, a briefing on the status of the Radford continuous automated single base line was presented to the PM. In March 1977, the branch presented a briefing to the PM on the method of nitroglycerin prove out for the Badger Biazzi plant. At the June project status review meeting of the black powder project at Indiana AAP, the planning, design and execution of the project was critiqued by PBM. An updated briefing on the status of the funding of the continuous automated single base line was presented to the PM in August 1977.

(U) Propellants Studies. Two major studies were completed during the fiscal year. The ad hoc committee to study the operability of the new TNT and acid facilities completed its effort and published its report in August 1977. A Value Engineering (VE) study was conducted by Day and Zimmerman on the construction design of the continuous nitrocellulose manufacturing facility for Badger AAP. Potential savings of approximately \$2 million in construction costs were identified by Day and Zimmerman. Evaluation of the VE recommendations is currently underway.

(U) MMT Project Activity (Propellants). During FY 1977, several major areas of propellant technology were pursued with MMT funding. A number of these were a continuation of multi-year process development projects, although some new projects were also initiated during the reporting period.

(U) After demonstrating the continuous automated multi-base line pilot plant in FY 1976, additional runs were made in FY 1977 to broaden process knowledge and to verify additional formulations. During the year, a pilot lot of M30A1 propellant for the 155mm M203 propellant charge was manufactured. Ballistic tests were to be conducted in the Spring of 1978. Additionally, a pilot lot of M26E1 propellant for the 152mm system was manufactured, and closed bomb tests were in progress. Parallel MMT efforts continued on the acceptance of continuously produced multi-base propellant. Development was completed on a semiautomated image analyzer and a rapid chemical constituent analyzer.

(U) Similar MMT efforts in the product assurance area continued for the acceptance of single base propellant produced by the continuous automated process. Development of a dyna gun for testing the acceptability of propellant in place of proving ground ballistic testing progressed satisfactorily.

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(U) Continuing effort also proceeded in FY 1977 on the ultrasonic extrusion of double base propellants. Techniques proven on a 2" solventless press were translated into a design for the 15" press and equipment was fabricated for that size extrusion facility.

(U) At Radford AAP the prototype final roll and pad makeup process for M8 solventless mortar propellant sheet was near completion. Debugging was underway and the effort was to be completed by the end of FY 1978. This process was to greatly reduce personnel exposure to hazardous materials.

(U) An MMT project was completed at Radford AAP for establishment of a prototype system for the continuous processing of benite, a strand propellant used in artillery primers. The MMT work covered the development of a design criteria for an automated process for the continuous manufacture of benite to replace the present batch manufacture of benite to replace the present batch manufacturing system.

(U) Considerable development work was done in the area of ball propellant manufacture in order to improve the process of making this critical propellant material. Under one of the MMT projects, the practicality of utilizing dichloromethane in place of benzene in reclaiming nitrocellulose from scrap propellant for ball propellant manufacture was demonstrated. Benzene was no longer considered an acceptable solvent since Occupational Safety and Health Act (OSHA) requirements placed a maximum exposure level of one part per million on its use. Progress was made on a second project to develop a driving system for the modernized ball propellant facility planned for Badger AAP in the mid-1980's. A fluidized bed dryer system had been selected for investigation and a hazards analysis for this system was initiated. A major effort was underway to perform pilot plant studies at Badger AAP in the development of an improved wet processing line for the modernized ball propellant facility previously mentioned. The pilot plant effort was to be completed in 1979.

(U) The PBM Office offered assistance to other PM's in facilitization of their programs for producing their specific items. Special teams were formed and assistance had been rendered to the PM VIPER, the PM XM1 Main Battle Tank and the PM ROLAND in helping them establish facilities for production of their products. The FY 1978 program was to present an even greater challenge for the establishment of better propellant processes and facilities.

Pollution Abatement Program

| | |
|-----------------------|---|
| FY 1977: Project 4114 | \$1,007,200 |
| FY 1978: Project 4214 | (Pollution Engineering for 1983-85 Requirement) |
| | \$1,180,000 |
| Project 6748 | (SCAMP Pollution Abatement) |
| | \$ 310,000 |

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(U) The omnibus pollution abatement technology project was being conducted with the FY 1977 funding. This project covered a period of nine years with a total expenditure of \$27,576,800. The work covered the pilot-prototype application of technologies for the pollution abatement of the metal parts manufacturing facilities, the specialized projects such as bio-monitors and chemical-pyrotechnic waste treatments, to the very extensive technology development and application of pollution abatement techniques for the military unique pollutants. Some of the salient efforts continuing from the previous year's report follow below.

(U) Munition Plant Pollution Surveys. Pollution Status Reports were completed for Volunteer and Sunflower AAP's. A series of reports for 15 manufacturing and LAP plants were completed in which sources, pollutants, regulations, MMT efforts and facility projects were documented. These reports permitted a more thorough assessment of the compliance (or potential violations) status of the manufacturing plants.

(U) Nitrobody Wastes. Studies were undertaken to investigate the feasibility of regenerating explosive-laden granular carbon. A number of methods were investigated for the regeneration of nitrobody contaminated carbon. The successful thermal regeneration of explosive spent carbon was to minimize black smoke air pollution problems resulting from the burning of explosive-laden carbon which was used on a once through basis, and was to result in significant cost savings of future carbon adsorption treatment process for the abatement of pink water.

(U) Propellant Wastes. Design criteria was developed and approved for the propellant waste streams at Radford AAP for support of MCA Projects 35, 10A, B. C. and D. Treatment consisted of physical/chemical pre-treatment of effluents from nitroglycerin, nitrate ester and alcohol rectification areas and secondary biological treatment by a rotating biological surface. The MCA projects were in the design phase.

(U) Industrial Wastewater Treatment, Holston AAP. Biological treatment of Holston AAP wastewater was demonstrated. As a result of this effort, the biological system was modified and accurate design parameters were defined. An oversized system did not have to be built, at a validated cost savings to the Government of \$1.4 million.

(U) Molecular Sieve Adsorption of NO_x. A modification of the valve system at Holston AAP eliminated sudden surges of gas, which resulted in making the molecular sieve system more reliable. Tests made in conjunction with nitric acid manufacture demonstrated NO_x emissions of less than 50 parts per minute (ppm) attainable with inlet concentration as high as 4000 ppm. This was a definite advancement

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in the state-of-the-art of NO_x abatement. Based on this work at Holston, Radford procured and was operating a molecular sieve unit for the NO_x abatement for the nitrocellulose operation.

(U) Red Water. Furnace reduction of red water (from the sellite purification step in the manufacture of TNT) was successfully demonstrated. Alternate processes achieved in controlling the operating of centrifuges used to remove nitrocellulose fines from water. An integrated system for monitoring all the gaseous emissions from the incineration of explosives was designed, installed, and demonstrated. Successful demonstration of source monitoring was completed for methyl nitrate from the azeostill used for the recovery of acetic acid for use in the manufacturing of RDX.

(U) Value Engineering Studies. As a result of VE studies conducted during FY 1977 a validated savings of \$10.7 million was achieved on Manufacturing Methods and Technology Engineering (MMT) project #5774114.

(U) Energy. In the energy area, the multi-task energy conservation technology Project 4281 was scheduled through FY 1980, costing \$5.6 million as outlined below:

| <u>MMT Energy Program Budget</u> | | | | | | | |
|----------------------------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| \$ Thousands | | | | | | | |
| <u>Proj.</u> <u>No.</u> | <u>Fiscal Year</u> | | | | | | |
| | <u>1975</u> | <u>1976</u> | <u>1977</u> | <u>1977</u> | <u>1978</u> | <u>1979</u> | <u>1980</u> |
| 4281 | 191 | 875 | 0 | 1000 | 1062 | 1285 | 1220 |
| 4027 | | | | | | 286 | 257 |
| 4474 | | | | | | 350 | 200 |
| 4481 | | | | 100 | | 425 | 449 |
| L079 | | | | | | | 600 |
| Total | 191 | 875 | 0 | 1100 | 1062 | 2346 | 2726 |

(U) The following tasks comprised the FY 1977 portion of Project 4281:

- Task No. 1-1 - Process Energy Inventory
- Task No. 1-4 - Energy Recovery from Waste Heat
- Task No. 1-8 - Cavitation Removal of Explosives
- Task No. 2-1 - Process Energy Inventory for Metal Parts
- Task No. 2-2 - Investigations of Reduced Forging Temperatures

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(U) Project 4281, Task No. 1-1. Detailed process energy inventories were conducted at Radford and Holston AAP's for the purpose of identifying energy conservation applications. This was done on a unit process operations basis using actual measurements coupled with sound analytical judgment. Those energy saving measures requiring minimal capital expenditure ~~were~~ being implemented under this effort. Others were being defined in the form of recommendations/work plans for follow-on efforts. To date, one energy saving measure had been implemented. This was the \$58,000 annual savings (under present operating level) resulting from the automation of the solvent adsorption cycle of Radford's activated carbon solvent recovery system.

(U) Project 4281, Task No. 1-4. The first two phases of a three phase contract with TRW was completed. This contract was intended to identify process applications at Radford, Holston and Volunteer AAP's where significant energy savings could be realized through the installation of heat recovery equipment or through process modification, and to develop design concepts to achieve these results. The three most attractive applications identified were: NC Purification Area at Radford - projected annual savings under mobilization, \$859,000; Activated Carbon Solvent Recovery Operation at Radford - projected annual savings under mobilization, \$898,000; and Acetic Anhydride Manufacture (Ketene Gas Cooldown) at Holston - projected annual savings under mobilization, \$590,000.

(U) A second contract was awarded to Grumman Aerospace Corporation to design, fabricate, install, and evaluate a heat pipe energy recovery waste heat from a forced air propellant dry house used to dry multi-base propellant. This project was to be completed in FY 1978. Installation of this recovery system at Radford AAP was projected to yield annual savings of \$1.0 million under mobilization conditions.

(U) Project 4281, Task No. 1-8. The feasibility of using cavitating jet technology to remove explosive filler from rejected projectiles ~~was~~ being investigated. A contract with the developer of this technology, Hydronautics, Inc., was let in July 1977. The contract scope of work (SOW) included safety testing, laboratory testing to determine performance of the cavitating jet, and a conceptual design of a pilot plant. If feasibility and early economic and energy analysis were confirmed, a prototype facility was to be designed, constructed, and evaluated in FY 1978-1979. Successful completion of this task was to have resulted in demonstration of a process which was to produce significant energy and cost savings when implemented at Army LAP facilities.

(U) Project 4281, Task No. 2-1. The FY 1977 effort was directed toward a similar survey of the Lake City AAP. TRW had been contracted to conduct the inventory and specifically to compare energy usage patterns between the conventional system of small caliber ammunition manufacture and the new SCAMP concept. This work was progressing and was to have been completed once the SCAMP module was operational.

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(U) Project 4281, Task No. 2-2. Under the FY 1977 effort, a contract was awarded to Scranton AAP to forge a quantity of 10,000 155mm M107 projectiles at the reduced forging temperature of 2000°F. Data gathered during this study will be used to accurately assess overall energy savings, effect on tool life, and overall impact on the manufacturing process. This work was scheduled to be completed in August 1978.

(U) Project 4481. The task to recover energy from AAP solid waste by utilizing pyrolysis technology was initiated in FY 1977. A comprehensive literature survey was conducted to identify all the companies/organizations involved in pyrolysis technology.

(U) Energy Steering Committee (ESC). This committee was originally chartered in March 1976 with co-membership between PBM and ARRCOM (now ARRCOM). Its objective was to provide a forum for exchange of ideas in energy conservation and management, applicable to the AAP's and arsenals. In September 1977, the ESC charter was revised to include the incorporation of ARRCOM as a coequal member with the original members, ARRCOM and PBM; meetings to be held quarterly; and chairmanship to rotate among PBM, ARRCOM and ARRCOM on a yearly basis.

(U) Subsequent meetings (June, September 1977) encompassed such areas of energy conservation and management as Fluidized Bed Combustion Boilers; Solar Energy Programs; Electrical Power Requirements Design; Fuel Selection Policies; Geothermal Energy; DA Energy Programs; and Energy Recovery from Waste Materials (Pyrolysis).

(U) As a result of these meetings, spin off efforts initiated the following:

Ad Hoc Committee on Electrical Power Analysis and Design. This committee was formed to guide and direct effort of a study to determine realistic demand and diversity factors to be used in electrical power design. The practice had been to inherently overprovide electrical power in order to be conservative in power supply capabilities. Up front savings in equipment and system sizing and reduction in standby power requirements (peak loads) could be obtained with more realistic demand/diversity factors.

PBM Energy Steering Committee (Internal ESC). This committee was formed in the image of the interagency ESC to increase the involvement of the PBM technical personnel in energy matters and possibly result in new ideas and energy savings suggestions. The ESC met monthly. The last meeting covered Energy Policies/Regulations; Electrical Power Systems Design; and on-going PMO energy efforts in pyrolysis, solar, geothermal, and power plants at AAP's.

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(U) RDX/HMX Expansion Facility. Public Law 95-82, dated 1 August 1977, authorized the RDX/HMX Expansion Facility project for \$334.7 million. FY 1978 funding was not appropriated pending the results of Presidential Review Memorandum 10 on current strategic policy which was to establish production requirements. Work on the RDX/HMX expansion facility during FY 1977 was concentrated in Environmental Impact Statement (EIS) and site selection, plans and schedules, design criteria, and design.

(U) EIS and Site Selection. The draft EIS was filed with the Council on Environmental Quality (CEQ) on 17 December 1976. It was revised to incorporate comments on the draft, and published, but not filed, with CEQ pending a site selection. The Secretary of the Army has deferred site selection pending the results of the PRM 10 study.

(U) Plans and Schedules. Execution schedules and funding plans were established and revised to reflect DA guidance which deferred construction during the FY 1979-1983 POM period. Final decision on design execution was pending; however, plans and schedules were established which identified critical milestones and provided continuity to project execution.

(U) Design Criteria (5752588). Baselineing of design criteria documentation for the RDX/HMX X-Facility was nearly completed. The criteria documents scheduled to be baselined during FY 1978 were the central laboratory, plus revisions to criteria as a result of inclusion of continuous wet Comp B incorporation, and production of Comp A-5 in lieu of PBXN-6 on line 2. The remaining criteria (acetic anhydride TDP and system control functional criteria) were projected to be baselined during the first quarter, FY 1979.

(U) Innovations approved to date were estimated to save \$6.3 million in capital costs and \$5.0 million in yearly operating costs. Major innovations approved during this period included continuous wet Comp B incorporation, automated materials handling at TNT receipt and loading dock locations, and improvement in acetic acid concentration.

(U) Design (57x2528). The nitrolysis, filter and wash, and acid recovery process and equipment designs were prepared and distributed for review in FY 1977. Dewater, incorporation and pack process and equipment designs were initiated and will be completed in FY 1978. Models of the equipment layouts were constructed during the FY 1977 time period. Additional models were to be constructed during FY 1978/1979. Design was to continue on additional project elements through FY 1979.

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Load, Assemble, and Pack

(U) Loading of 60mm XM720 and 81mm M374A3 (Melt Pour) - Milan AAP (Project 5782709). During the past year, the CE design of this project was completed. The final design was completed in January 1977, and the design of the pink water system was scheduled for completion in November 1977. The Technical Data Package (TDP) for equipment design was baselined and reviews were made of the control system and the equipment Reliability, Availability and Maintainability (RAM) requirements.

(U) The testing of the prototype Minute Melter and cooling system continued. A viable process was developed for the 81mm melter, but testing was discontinued when problems developed with the melter.

(U) A problem was encountered with the Milan developed pouring unit. This unit, based on a pressure-siphon system, was not able to provide consistent fill levels in the 81mm rounds. This was probably due to settling out of the explosive and because of viscosity variation in the explosive. The design of the pouring machine has been assigned to ARRADCOM. They were pursuing this design which was based upon those that were in use at ARRADCOM or planned for use at Lone Star.

(U) It was expected that the design of the pouring machine was to have been completed and entered into execution in the next fiscal year.

(U) MMT Automated Inspection Device for Explosive Cast in Shell - ARRADCOM (Project 4454). This project, for the automated inspection of explosive cast in HE shell, was still in the MMT stage at AMMRC. A contract was issued to IRT Corporation in San Diego, California, to develop an engineering model for inspection of 105mm HE shell. Because of the financial situation of this contractor, it was necessary for USA Materiel & Mechanics Research Center (AMMRC) to purchase and provide most of the equipment, Government Furnished Equipment (GFE), to the contractor. This placed a heavy load on the AMMRC engineer to expedite the procurement of the GFE. All the GFE was provided to the contractor and assembly of the engineering model had begun. The concept model was run with computer control and data taken.

(U) In order to obtain a picture of the required funding to complete the AIDECS effort, AMMRC requested a cost to complete for the IRT Corporation and justification for any increases necessary. Since the time of the submission, there had been much negotiation and discussion on project cost between AMMRC and IRT Corporation. PBM and AMMRC had discussed the problem with DARCOM, and DARCOM provided additional funding. The costs were still under negotiation

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and assembly of the AIDECS system was continuing. It was anticipated that in the next year, the funding questions were to have been resolved, the system completed, tested and delivered to ARRADCOM for prove out with live rounds.

(U) Automatic X-Ray Inspection System (Project 4327). The prime purpose of this project was to provide the prototype hardware for an Automatic X-Ray Inspection System to automatically read and interpret X-ray film for the purpose of detecting defects in HE artillery projectiles. Because of problems in obtaining a contract, funds were traded off and the project delayed.

(U) A contract was awarded and work was progressing. The feasibility of defect detection was established for all but base separation together with the feasibility of using a TV scanner.

(U) It was expected that in the next report period, additional funds would be provided and the feasibility of using AXIS for tank rounds determined together with use of AXIS in the Milan AAP Central X-ray Facility.

(U) Image Amplification System (Project 5722163). Work on the Image Amplification System developed at Kansas AAP for the detection of defects in mortar rounds. ARRADCOM and Kansas developed a specification to provide for the modifications necessary to make it a usable system. In the next report period, the modifications to the system were expected to be completed and the system tested.

(U) Application of Radar to Ballistic Acceptance Testing of Ammunition (Project 4139). This project provided for the development of a radar system especially suited for ballistic acceptance testing of various types of ammunition. The end result was to be a tested prototype system including radar, data collection, transmission equipment and data handling computers. This project was the link between the modernization of the ammunition plants and the testing of the ammunition produced by these modernized plants.

(U) Initiated in FY 1970, this project continued through FY 1978. Additional funds were provided by the PM in FY 1976, and the funds were given in FY 1977 to continue the effort into FY 1978. At the request of the PM, ARRADCOM came in with a request for additional funding to complete the project by the end of FY 1978.

(U) Negotiations were in progress to complete the ARBAT in this time period. It was expected that the additional funds were to be obtained to complete the effort in the next report period and the prototype effort reach completion.

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(U) At the present time, most of the system units were complete and work was to resume on the system shortly.

Investigation of Loading AMATEX 20

(U) Under this project, the Army was directed to evaluate the use of AMATEX 20 as an alternate fill to replace Comp B in the loading of medium and large caliber shell. It involved the development of production processes for manufacture and loading of this explosive as well as a study of the economics of using AMATEX 20.

(U) During this period, conceptual production layout for AMATEX 20 was developed with cost estimate for these layouts.

(U) In February 1977, an IPR was held to put forth the DARCOM position on the use of AMATEX 20 with DARCOM, ARRADCOM, ARRCOM, AMSAA, PBM, TECOM and TRADOC. The position stated as follows: (This was the portion directly related to PBM.)

"Under the constraints of current MOB requirements/facility capabilities:

"a. Consideration of AMATEX 20 in facility planning for MOB use is not recommended since the capital costs are excessive as compared to those for TNT which is currently the approved alternate fill for Comp B. The small incremental improvement in effectiveness of AMATEX 20 over and above TNT does not offset the major capital cost differential between provision of AMATEX 20 facilities as compared to TNT facilities.

"b. No further effort will be expended to qualify AMATEX 20 loaded standard projectiles in the 105mm XM204 and 8 inch M110A2E1 systems nor will AMATEX 20 be required to be evaluated as an alternate fill for mobilization. Also, no further process development will be undertaken."

(U) As a result of the IPR, all further process work at ARRADCOM was halted. In the next report period, ARRADCOM was to complete the final report on the AMATEX 20 effort.

(U) Surface Launched Unit Fuel Air Explosive (SLU-FAE) IAP Facility IPF, Hawthorne AAP (Project 5790003-01). In March 1976, this office assumed responsibility for managing Navy projects for ammunition items. The SLU-FAE was a rocket propelled mine field neutralizing round. It offered a stand-off capability for clearing mine fields. The round was under development by the Naval Weapons Center at China Lake and was funded through MERADCOM. Type classification for the round was scheduled for FY 1979.

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(U) The criteria for the renovation of the site for SLU-FAE production was baselined in April 1977. Also, the contract for the design of facility work was awarded by the Sacramento District, CE. Concurrently, NAPEC submitted the production equipment criteria to the Army for review. In March 1977 the site safety plan was approved by DARCOT Safety, conditional to incorporation of protective barricades between production work stations. In July 1977, a joint Army/Navy meeting was held to discuss safety requirements, the outcome of which resulted in the reclassification of Propylene Oxide from a propellant to a flammable liquid, thus reducing the scope of the hazards requiring work station protection.

(U) The baseline of the equipment criteria took place in August 1977. In addition, the concept design for facility renovation was reviewed and approved to proceed with final design.

(U) In October 1977, NAPEC submitted the Equipment TDP for the entire production facility. This package served as the basis for the final design cost estimate. However, since the SLU-FAE munition was still in development, with minor changes, deletions, and additions to the production work stations expected.

(U) The Sacramento District, CE, submitted the facility project final design for review in December 1977. A final design review meeting was held in January 1978, during which time all review comments were incorporated into the design package.

(U) Upon submission of the equipment TDP, NAPEC terminated their engineering support of the project. In order to complete the production line design, support engineering and procurement packages, the Naval Weapons Center, China Lake, CA, agreed to provide the necessary engineering support to Hawthorne AAP. It was expected that the delay encountered in changing design agencies would not impact project execution.

(U) The standing requirement to provide work station separation, primarily for fire protection, was resulting in substantial changes to the existing production line flow layout. It was expected that the relocation of several work stations within existing concrete cells would meet all the safety requirements. The design of the facility site work will have been completed following safety approval of the production line flow redesign.

(U) 105mm Melt Pour Facility - Lone Star AAP. During the reporting period, the construction portion of the project advanced from 66 percent to 94 percent completion. Modification of the construction contract was made to incorporate additional time for execution based on time lost due to adverse weather and design changes. As a result, the Beneficial Occupancy Date (BOD) slipped from April to August 1978, and expected contract completion slipped from June to August 1978. The Construction Work Estimate (CWE) was reduced from \$11.5 million to \$10.9 million and sufficient funds were available for completion.

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(U) Procurement, delivery, and acceptance testing activities dominated the DARCOM equipment portion of the project during the report period.

(U) During the year, 13 equipment items valued at \$3.7 million were placed on contract or in-house work order, bringing the total contracted amount to 42 items worth \$11.9 million. An additional 17 items valued at \$1.6 million remained to be awarded. Also, eleven equipment items valued at \$1.1 million were accepted during the year. Cumulative acceptances were 23 items with a value of \$1.7 million, through the end of 1977.

(U) With the finalization of ARRADCOM test input related to controlled cooling, explosive riser processing, and thread cleaning, the completion of procurement TDP's for all production equipment was made possible.

(U) Project funds of \$164,000 were issued to ARRADCOM to perform the supplementary testing required. Programs were completed involving the confirmation of the controlled cooling cycle, testing to assess the sizing of crushed explosive riser material as it related to reprocessing and material handling, an assessment of an alternate pouring funnel design to possibly reduce fuze thread contamination and eliminate thread cleaning equipment, and a hazard analysis of the explosive riser reprocessing system. Testing to determine the configuration and required shielding for an improved fire protection system was placed on contract and was scheduled for completion in April 1978.

(U) The controlled cooling test program, a major portion of the ARRADCOM effort, verified the 105mm cooling process established earlier. Test equipment closely simulating the actual production environment was acquired, installed and utilized to confirm the 83 minute cooling cycle. The testing program provided assurance of process reliability and highlighted that room drafts, high explosive pouring temperatures, and small explosive risers could contribute significantly to explosive cast defects.

(U) Another major accomplishment was the engineering, by ARRADCOM, of an improved Fire Protection and Detection System. The design utilized ramp-installed "hardened" deluge subsystems capable of functioning after being subjected to an explosive incident. The system was comprised of a floor mounted, strengthened nozzle array, supplied by a protected water main and deluge valve which was triggered by expendable, fast acting ultraviolet sensors. Strategically located rate-of-flow valves metered water flow in major branches of the water supply system to protect against uncontrolled flow and maintained system operating pressure if a pipe was ruptured by an explosive incident.

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(U) This type of system was unique in GOCO plant operations, offering considerably higher levels of protection than before possible. Wide application in the balance of the GOCO production base was anticipated.

(U) A VE Funded Study for size reduction and/or segmenting of explosive risers was proposed by Lone Star AAP, evaluated and funded. The study proceeded to an inconclusive early halt based on limited Lone Star AAP testing capability and conflicts with production activities. Completion of the test plan, using the balance of funds available at Lone Star, was to be accomplished by ARRADCOM after supplemental VE funding and required explosives (Comp B) were secured.

(U) The Demonstration Test Specification (DTS) governing project prove out was finalized utilizing a unique approach for production system prove out developed in collaboration with ARRADCOM. The procedures developed divide "prove out" into three phases: Equipment Debug, Process Validation, and Demonstration Test. An orderly, methodical succession of events were outlined, with prerequisite levels of performance required prior to proceeding from each step. By monitoring system production capacity and end item quality continually, learning curve data would be accumulated for future use, and testing resources could be conserved as much as possible.

(U) The procedures developed for the Project 5752626 DTS could be applied to other complex systems to maximize the confidence level in system capability and minimize the testing resources required.

(U) MMT-Development of Detonation Traps for Improved Safety in Munitions Process Plants. The purpose of this three year program (FY 1973 - FY 1975) was to improve plant safety through the development of effective detonation traps which could be installed in pipelines carrying explosive substances to halt the propagation of a detonation.

(U) All physical work was completed in 1976. During the report period technical reports and a comprehensive final report were completed and the project was closed out.

(U) MMT-Automated Line for Melt Pour Processing of High Explosives. Under this program prototype equipment was developed and tested on a pilot plant scale for continuous melting, controlled cooling of 105mm projectiles, mechanical crushing of explosive riser scrap, automated explosive pouring, process instrumentation, and remote controls. The designs and data generated formed the basis for greatly improved production scale melt-pour modernization of medium and large caliber projectile loading facilities.

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(U) During the report period, duration tests of the Lapp explosive pump were completed with only insignificant stretching of the original pump diaphragm after 380 hours of use. The maximum melting rate of 1035 pounds per hour and explosive recycle times of up to 14 hours were established.

(U) All testing and evaluation of the explosive riser crusher were completed and final equipment design criteria provided to Lone Star AAP in support of Project 5752626.

(U) An explosive delumper was successfully tested at Iowa AAP in conjunction with the automated explosive inspection machine. The final report on this aspect of the project was completed and distributed. All work under this project was completed and preparation of final reports was begun.

(U) MMT-Continuous Automated Post Cyclic Conditioning Facility for Large Caliber Composition B Loaded Projectiles. The purpose of this single year effort was to develop controlled cooling procedures for TNT loaded and Comp B loaded 155mm, M549/XM795 and 8 Inch, XM650 projectiles to produce optimum cast quality and tightness, enhancing the effectiveness of subsequent heat treatment (cyclic conditioning) processes. The data generated was to be utilized as a basis for production processes to be used in facility projects for these rounds at Iowa AAP and elsewhere.

(U) The project effort during the reporting period was directed toward the establishment of an in-house ARRADCOM test loading capability. A special pouring funnel was designed for the 8 Inch, XM650 projectile, and explosives and projectile metal parts were acquired to support the testing. An experimental automated pouring manifold was designed and procured, and equipment/building layouts were prepared for installation of the controlled cooling test equipment. Special split projectile test fixtures were designed to be reuseable in testing of the 155mm, M549 and 8 Inch, XM650 cooling cycles. Detailed test procedures were finalized and installation of the controlled cooling test equipment was completed in Building 1033. Testing was scheduled to commence in February 1978.

(U) MMT-Automated Pilot Line for Controlled Cooling and Processing of HE Loaded Projectiles (Project 57X4263). This continuing project (FY 1974 - FY 1978) was to expand existing melt-pour pilot plant facilities at ARRADCOM to include projectile processing work stations, a controlled cooling system, and a material handling system for continuous processing of medium and large caliber projectiles under the control of a programmable logic controller. The controlled cooling system was to provide air and water cooling capability, explosive riser heating, variable speed processing and automated control of air temperature, air flow rate, water temperature, and water level. The facilities were to be used to establish process criteria for the modernization and expansion of large scale loading lines.

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(U) During the report period, the facility construction effort, which commenced in February 1978, proceeded to an estimated 85 percent completion. Delays were encountered due to adverse weather and the need to increase the capacity of the electrical substation supporting the facility.

(U) The ground level conveyor system, metal part preheat system, indexing machine and transfer gantry were fabricated, delivered and installed in the pilot plant. Fabrication of the controlled cooling system components was completed and assembly at the contractor's plant 60 percent complete in December 1977. The instrumentation inclosure was fabricated and installed and wiring of controls and sensors initiated. Erection of the post heater shroud framework was completed and the steam thermal panels installed. The pilot plant was scheduled to be in operation by June 1978 and the testing phase completed in September 1978.

(U) LAP, 8 Inch, XM650 IPF. Based on identification of project need in mid-August 1976, planning for a separate facility project to support Fiscal Year Defense Plan (FYDP) buys of the XM650, 8 inch projectile was initiated in October 1976. A preliminary project approach was developed with Iowa AAP based on the required capability of 1000 rds/mo by January 1979 and 4000 rds/mo by January 1980 on a 1-8-5 (FYDP) production basis.

(U) An advance P-15 requested through ARRCOM was received from Iowa AAP in December 1976 and reviewed. In order to maintain schedule as a late start FY 1978 project, the project was revised in coordination with Iowa AAP from \$1.2 million to under \$0.9 million so that PM approval under delegated authority could be exercised.

(U) The Apportionment submission in April 1977 was successfully trimmed to \$898,400 without significant impact on production capability.

(U) In March 1977, an omnibus SOW design of the subject project was prepared and forwarded to the Programs and Budget Branch for implementation. The estimated value of \$112,378 was a reduction from the original plant estimate of \$138,782. Concurrently, ARRADCOM was tasked to develop the product assurance plan for the project.

(U) Due to the increasing level of engineering activity, the many ARRADCOM elements involved, the complexity of the item design and its development status, the need for an ARRADCOM single POC became evident and was identified to ARRADCOM in April 1977. ARRADCOM agreed and responded with the designation of Mr. E. Feddema, DRDAR-LCM-PP, in May 1977. He has since provided invaluable assistance to PBM in assuring effective coordination of all project related engineering and planning activities.

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(U) Omnibus funding requirements were reviewed with the single point of contact (POC) and the sum of \$150,000 determined necessary for FY 1977 ARRADCOM support. Expedited release of \$20,000 was accomplished in May 1977 with the balance of \$130,000 released in June 1977.

(U) Also in June 1977, an ARRADCOM task team was assembled by the single POC to review the project design approach in comparison with ARRADCOM R&D loading experience and overall process and product assurance requirements.

(U) On 13-14 July 1977, a technical review meeting was held at Iowa AAP to refine process description, process design criteria and to resolve and incorporate comments.

(U) Continual liaison with the single POC and Iowa AAP was maintained during the finalization of process documentation. This culminated in a meeting at Iowa AAP on 21-22 September 1977 to review the final process descriptions and process flow sheets which are critical parts of the equipment functional criteria. The Equipment Functional Criteria Phase and Equipment TDP Phase were in progress at the end of the reporting period with baselining scheduled by March 1978.

(U) 155mm, M549 and 8 Inch, XM650 LAP Facility - Iowa AAP. The purpose of this project was to expand the production capability at Iowa AAP to LAP the M549 155mm and XM650 8 inch production rates (67,000/mo - M549; 9000/mo - XM650).

(U) At the start of the report period, the project was programmed in FY 1982, and a small amount of omnibus funding was available at Iowa AAP for investigation and planning. The March 1977 revision of the Modernization/Master Plan advanced the project to FY 1981. A preliminary project submission valued at \$115,902,000 was received from Iowa AAP in May 1977, based on design guidelines established by ARRADCOM/PBM, and an omnibus SOW released in the amount of \$88,228 to Iowa AAP for completion of the criteria phase. An ARRADCOM single POC was established to coordinate the engineering/design support for Iowa AAP, based on the diversity of ARRADCOM staff elements involved and the developmental nature of the items. A POC for US Army Engineer Division, Huntsville Headquarters design and cost estimating support was identified.

(U) ARRADCOM was funded \$150,000 through the single POC for FY 1977 ARRADCOM omnibus support. Also, ARRADCOM was tasked to prepare a process baseline delineating a comprehensive outline and description of the facility configuration.

(U) In June 1977, a status briefing to the PM resulted in the decision to sever the XM795 155mm projectile from the project planning, based on development schedule incompatibility.

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(U) A series of project working meetings resulted in a viable project plan that would provide Alt I capability for the M549 and XM650 at a cost of approximately \$50.0 million (FY1981 dollars). Based on a review by the Deputy Project Manager (DPM) in August 1977, the project was redirected to be advanced from FY 1981 to FY 1980, have a \$20.0 million (FY 1980 dollars) cost ceiling, have a capability for TNT loading only, and utilize only proven, cost-effective design features.

(U) An intensive project reconfiguration was undertaken and a revised project proposed conforming to the redirected guidelines was presented to and approved by the DPM and PM in November 1977. ARRCOM was formally apprised of the project design approach and proposed siting on Line 3A at Iowa AAP, and subsequently furnished their concurrence in December 1977.

(U) Preliminary Construction Design Criteria were completed by Iowa in December 1977 and submitted. An on-site review was scheduled in late December 1977 and subsequently rescheduled in January 1978 based on availability of attendees. The Process Baseline was in the final stages of preparation by ARRADCOM at the end of the report period, and scheduled for baselining in February 1978.

Tank Chemical & Nonballistic Munitions Activities

(U) EXP of LAP for 155mm, XM712 Warhead - Iowa AAP. This project was to expand capacity to LAP, XM712 Copperhead Warhead established by a 1978 IPF project under management of PM-CAWS. Project capacity was scaled to meet Five Year Defense Plan (FYDP) buys and to balance scheduled production capacity of component parts.

(U) Efforts for this project had been constrained by process development under the proceeding Initial Production Facility (IPF) project. By fourth quarter 1977 it appeared that adoption of the highly successful melt-pour techniques used for TOW and DRAGON lines at Iowa AAP would be practical for this item.

(U) IPF to LAP the VIPER - Iowa AAP. This project will establish a production base to Load, Assemble and Pack (LAP) the ILAW, VIPER. This IPF was being managed in conjunction with the PM-VIPER, a MIRADCOM office. The projected capacity was scaled to meet scheduled FYDP buys and to balance production of component parts from commercial contractors.

(U) Significant delays have been experienced due to design problems in the R&D phase.

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(U) MMT - Automated Loading of Flash Reducers. This project had cost growth problems. The first cost growth was due to the increased cost of Government-furnished material. Upon approval of this increase, the equipment vendor submitted a cost growth on development of the equipment. This cost growth had been returned to the vendor for additional backup.

(U) The equipment which was designed and fabricated awaited approval of the cost growth to complete debugging, testing and installation at Indiana AAP.

(U) MMT - Automated 105mm Cartridge Case Assembly. During the past year, the equipment was designed, fabricated and tested. Although the test was successful, the equipment was not to be utilized in a facility project at this time. The equipment was best suited for a facility project that not only loaded the prop charge but also packed out the cartridge cases. The facility projects that would provide the above had been deferred to the late 1980's. This project was completed in September 1977.

(U) MMT - Upgrade Performance of Bag Buffer, Mandrel-Clamshell Interface and Inspector Sensor Equipment for 105mm, M67 Propelling Charge. This project was completed in October 1976. The Mandrell clamshell and sensor equipment were considered successful. These designs were to be utilized in follow-on procurement under Project 2500. The bag buffering equipment was not successful in meeting system criteria and all follow-on work in this area was suspended.

(U) Modernize Propellant Charge Bag Manufacturing - Indiana AAP. This project provided automated sewing systems to manufacture propellant bags, flash reducers, igniter pads and ancillary cloth slitting and printing equipment. All equipment was delivered, installed and operated, except a printer. The printer was tested and when it failed to meet its design requirements, procedures to terminate the contract without further cost were instituted. Project completion was estimated for January 1978.

(U) 105mm M67 Prop Charge Assembly System - Indiana AAP. The automated system to assemble the 105mm M67 Prop Charge was successfully tested in February 1977. This project was completed in September 1977 when the scale used to checkweigh the charge assembly was tested and accepted. The remainder of the equipment to fill out this production system was to be procured under Project 5782500.

(U) 105mm M67 Bag Loading Operations - Indiana AAP. Simulated testing of the Quality Assurance System was completed in December 1976. Installation of this system was delayed until late 1977 because of contract re-negotiations resulting from delays caused by the suspension of disbursements for FY 1971 and prior years. The extremely

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cold weather in January and February 1977 forced further delays in completing this project. However, in July 1977, the prototype booth was successfully tested and it was estimated that this project would be completed in January 1978.

(U) 105mm, M67 Bag Loading and Assembly Operations - Indiana AAP. The FY 1977 portion of Project 2500 provided the building and the FY 1978 portion provided the equipment. The construction contract for this project was awarded 27 June 1977, and the ground breaking ceremony was held on 15 August 1977. Work on the site proceeded on schedule with completion estimated in August 1979.

(U) Accomplishments in the past year were the apportionment submission of the P-15, completion of the designs for the deluge and the pneumatic conveying systems, and the successful testing of equipment developed by the related MMT projects. Project approval was anticipated in October 1977 with release of funds to follow in January of 1978.

(U) Additive Liner Manufacturing Operations - Indiana AAP. Additive liners were a mixture of titanium dioxide and wax applied to a cloth backing. They were usually sewn into a propellant bag for the purpose of reducing gun tube wear.

(U) During the past year, rehabilitation of the building to house the automated equipment was completed in November 1976. The automated equipment was designed, fabricated and tested at the vendor's plant. Difficulties with automatic sewing of the mylar film to the face of the liner led to its deletion from the system.

(U) The system was scheduled for delivery to Indiana AAP in November 1977 with debugging and acceptance testing to follow in December 1977 and January 1978, respectively. Expected completion was in March 1978.

(U) 60mm/81mm Prop Charge LAP IPF - Indiana AAP. This project was initiated in February 1977 and provided manual assist equipment to load the new mortar prop charges (horseshoes). It was expected that the equipment would be available in July 1980 to fulfill FYDP production orders. Accomplishments during this period were the P-15 Budget submission and initiation of equipment design and layout of the production line.

(U) Application of Solar Energy for Boiler Feedwater - Lone Star AAP. This project was to provide facilities to preheat boiled feedback using solar energy. The SOW included the purchase and installation of solar panels and associated piping and controls. It was to be the first solar energy project to be executed at any of the

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AAP's. Lone Star developed the equipment functional criteria during the fourth quarter of FY 1977. It was to be submitted along with the TDP in the first quarter of FY 1978.

(U) Central X-Ray Facility - Milan AAP. This project was to provide the construction of a complete facility for X-ray operations and the procurement and installation of X-ray process equipment. The initial criteria, submitted in January 1977, consisted of three buildings at an estimated budget cost of \$2.7 million. The site safety plan for this layout was disapproved based on quantity distance and protection category violations. A meeting was held at ARRCOM safety to determine an acceptable layout. In May 1977 a revised criteria was submitted with an estimated \$4.8 million in construction. The revised layout consisted of ten new buildings, and in May 1977 the construction design was awarded to Walk Jones, Francis Mah of Memphis, Tennessee. The concept phase of design was omitted to ensure the final design could be completed on November 1977.

(U) IAP of M732 Fuse - Lone Star AAP. This project will establish a production base for the IAP of the M732 Proximity Fuse. This was an artillery fuze that will be shipped separately to the field.

(U) The design for the equipment was accomplished in-house by the operating contractor, Day and Zimmermann Inc., and the TDP was completed and submitted for review in December 1976. The package was baselined in February 1977. During FY 1977 the project value was increased by \$72,000 due to changes in the SOW. The changes included the addition of conveyors for transferring metal cans from the unpack area to the pack out area, the desiccant-to-tube taping operation was not to be done with an automatic machine, and the fuze marking machine had been deleted since there was no requirement for a Lone Star lot number. The project value at Apportionment was \$1,757,000. The contract SOW was initiated through ARRCOM in April 1977, and the review and approval was expected in the first quarter of FY 1978.

(U) IAP of M739 PD Fuze - Milan AAP. This project was to provide production facilities at Milan AAP to IAP the M739 Point Detonating Artillery Fuze. The TDP for the fuze required that the fuze be loaded in an environmentally controlled atmosphere. Also, the specification called for a four hour curing period prior to assembly and a 24 hour curing period for the RTV sealant after assembly. This requirement reduced the capacity of the line due to quantity distance restrictions. The line was designed to produce fuzes at a rate which would satisfy the Alternate II requirements. During this fiscal period the Alternate II requirements increased and the plant was requested to maximize the production capacity of the line without violating the quantity distance requirements. This capacity was reduced considerably by imposing the 24 hour curing period. The construction design was awarded to Pickering, Wooten, Smith, Weiss, Inc., from Memphis, Tennessee.

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Concept was initiated in December 1976 and completed in June 1977, when the final design directive was issued. Completion was expected by the first quarter of FY 1978. The equipment TDP was submitted in June 1977. The package was based on an outdated TDP for the fuze. Upon receipt of the latest fuze TDP the plant was to submit the equipment TDP for review. Baselineing of this package was scheduled for the third quarter of FY 1978.

(U) LAP of Mortar Fuzes - Milan AAP. This project was to establish a production base to LAP the M567 and M734 fuzes. The M567 fuze was a point detonating fuze for the 81mm mortar round and the M734 was a multi-option fuze for the new 60mm mortar round (M720). The construction concept design was initiated in December 1976 and was submitted for review in May 1977. The concept design was to be baselined in the first quarter of FY 1978. The request to initiate final design was issued in July 1977 and completion is expected by November 1978. The design contract was awarded to Pickering, Wooten, Smith, Weiss, Inc., from Memphis, Tennessee. The equipment TDP was submitted in November 1977. Comments on this package indicated that Milan AAP did not have the latest TDP on each of the fuzes. There was an internal problem at ARRCOM that prevented the load plants from obtaining the TDP's on items that are not currently being produced at that plant.

(U) The Equipment TDP was to have been baselined upon receipt of an up-to-date TDP for the fuzes. This was expected for the second quarter of FY 1978.

(U) Facilities Modernization - Louisiana AAP. This project was to provide support facilities for current and projected production schedules. In October 1976 this project consisted of nine of the original subprojects. The work included new guard houses, road work, railroads, warehouses and electrical power systems. At the final design review meeting in December 1976, the design for the Chemistry Lab was disapproved due to safety violations. Louisiana AAP was tasked to submit a revised criteria for the Chemistry Lab including a new location. The revision was approved by safety and the design was expected to be awarded in FY 1978. Two subprojects, No. 06 Rehabilitate Primary Electric System, and No. 17 Guard House - Gate No. 2, were deleted from this project and programmed in the FY 1979 and 1978 Program Support and Equipment Replacement (PS&ER) Program.

(U) Power Requirements for Load Line #5 - Indiana AAP. This project provided the required electrical power for the modernization of load line #5 and to provide sub-station capacity for the planned future modernization of three additional load lines. The construction was completed in the first quarter of FY 1977. Final physical and financial close out was initiated in FY 1977 and completion was expected for the second quarter of FY 1978. The final value of the project was \$496,809.

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(U) Modernization of Support Facilities - Iowa AAP. This project consisted of two subprojects. Subproject No. 1 provided access roads to storage igloos. Subproject No. 2 provided a new primary water supply system to replace the existing deteriorating reservoir system. The construction was completed and closed out in the second quarter of FY 1977.

(U) Rehabilitate and Improve Main Heating Plant - Iowa AAP. This project was to provide for the rehabilitation of an existing heating plant. The SOW included the improvement of equipment such as the coal handling system, burner management system, feedwater system, and the central control system. The scope was increased to include a topping turbine as a result of the concept design. Concept design was awarded to Stanley Consultants, Inc., Muscatine, Iowa. Prior to concept design, the project was submitted at budget for \$2.9 million. Concept design was initiated in December 1976 and completed in April 1977. The topping turbines were recommended at this stage to reduce the steam pressure thus obtaining electric power as a by-product. This change in scope increased the project for review in FY 1978.

(U) MMT - Automated Propellant Bag Mfg. & Process Control Equipment - ARRADCOM. The bag manufacturing equipment was finished and prepared for a demonstration test. The test failed and additional debugging was continuing in an attempt to eliminate some of what was believed to be minor problems.

(U) The process control equipment was finished and demonstrated satisfactorily. This equipment could optically scan the cloth for holes, ink and oil spots and correctly printed legend. The TDP was completed and was to permit future procurement for both the 105mm and 155mm/8 inch production operations.

(U) MMT Automated Loading, Assembly and Pack Out of 155mm/8 Inch Center Core Propellant Charges - ARRADCOM. The prototype modules for the loading and assembly was designed and fabricated. While the tests in the assembly module were scheduled for second quarter of FY 1978, the loading module was demonstrated and accepted at the contractor's plant. The pack out system had been designed and fabrication initiated with subsequent test scheduled for late FY 1978. These modules were those planned for installation into Crane AAA under facilities Project 5790012.

(U) During this year the prototype equipment had been undergoing extensive debugging and redesign. As a result of the continued problems with the loading module, an evaluation was made to determine the practicability of continuing with this effort. It was determined from the analysis conducted that effort on the loading module and associated scale and buffer should be terminated and the assembly, pack out and inspection equipment finished up.

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(U) Upon completion, the equipment was to be sent to Indiana AAP for incorporation into an existing line for use on the current production buys. Following this philosophy, we would not require a new building to house this equipment and we would likewise be able to provide equipment utilization at the earliest possible time. ARRADCOM was asked to restructure their program based on this decision so the facility interface and new schedules worked out. This revised schedule was to be completed by second quarter FY 1978.

(U) Improvement to HC Smoke Mix Facility - Pine Bluff Arsenal. This project was to modernize an antiquated HC Smoke Mix facility utilizing the latest available technology. Processing operations were to be automatically controlled to eliminate hand operations, and a more homogeneous mix without moisture contamination would result. The final contract of the project was awarded in September 1976. Final equipment delivery and installation were made in September 1977, and October 1977 respectively. Equipment debugging was initiated in November 1977 and the project work was expected to be completed in June 1978.

(U) Illuminant, Mixing and Consolidation Facilities - Longhorn AAP. This project was to provide a new building complex and equipment for the modernized methods developed under MMT Project 5744241. The MMT project developed automated processes for mixing, consolidating, conveying, weighing, dispensing and preparing canisters for illuminant munitions.

(U) The uncertainty in illuminating round requirements held up the fiscal obligation from the planned release in November 1976 to June 1977. However, the project was proceeding according to the revised schedule.

(U) All production equipment contracts had been awarded. Equipment installation contracts could not be awarded until the facility was available for occupancy.

Selected Ammunition Facilities

(U) LAP 155mm, M483 Projectiles - Lone Star AAP. This project was established to expand the production base at Lone Star AAP to permit LAP of the M483 155mm DPHE Projectile and support planned production schedules and mobilization requirements.

(U) Funding was authorized in FY 1974 and initial equipment installations were made in the 2d Quarter FY 1975. Equipment installation and debug was completed in October 1977. Low Rate Initial Production commenced in October 1976 and was used throughout an extensive debug period to build up to the design production rate. During the one-year period between Low Rate Initial Production (LRIP) and final debug, major difficulty was experienced with the automated grenade/fuze assembly machines. An Army IPR Team was formed and chaired by

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PBM with representatives from PM-SA, ARRADCOM and ARRCOM. Concurrently, Day and Zimmermann formed an action team of management from both the Lone Star Division and Kansas Division. These two groups met regularly for the period June through October 1977 to identify and resolve equipment and production problems. Improved individual equipment rates have been achieved and are now able to meet or exceed forecast production rates.

(U) LAP 155mm, M483 Projectile - Kansas AAP. This project was established to expand the production base at Kansas AAP to permit LAP of the M483 155mm DPHE Projectile and support planned production schedules and mobilization requirements.

(U) The FY 1974 project authorized funding for the equipment and the FY 1975 project authorized funding for the construction effort.

(U) Concurrent with Project 5745509, Kansas AAP was having the same difficulty with start-up and debug. However, by the end of the fiscal year, one shift production output was capable of meeting 1-8-5 mobilization rates.

(U) LAP 8" M509 MPHE Projectile - Lone Star AAP. This was the first project to expand the production base for LAP of the 8", M509 Projectile establishing a mobilization capacity of 22,000 rds/mo. This project, along with 5745509, was funded in FY 1974 in that both projects had an alternate capacity to produce either the M483 or the M509. Installation and debug of the equipment was completed during FY 1977. However, debug and prove-out of the M509 final assembly had not been completed since projectile metal parts would not be available for production until early FY 1978.

(U) Development of Rotary Continuous Motion M42/M46 Grenade/Fuze Assembly Machine - Kansas AAP. This project was a late start project established to develop a prototype high speed rotary assembly machine for M42/M46 Grenade/Fuze assemblies to overcome many of the difficulties experienced with the debug and prove-out of the indexing machines supplied under Projects 5745508/5745509/5745514. The SOW and performance specifications were completed during the last quarter of FY 1977. Forecast of a sole source contract award to Automated Systems Division of National Lead Industries was forecast for December 1977.

(U) 105mm, XM710 HE Projectile - ROOK IPF. During the report period, effort on this project was cancelled in that R&D development was drawn to a close without Type Classification, and procurement plans were cancelled. Equipment TDP's were to be completed and put on the shelf for future use, if required.

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(U) LAP Projectile, 155mm, XM718/XM741 IPF (Phase II) - Iowa AAP. The second increment IPF was to balance out the initial equipment procured under Project 4860-01. This project was restructured into two subtasks. (1) A SOW, for the first effort, was released to ARRCOM for the procurement and installation of two main charge presses. It was planned to award the contract on a CPAF basis. This scope would serve as a production contingency in the event the award of the second effort was delayed. The award was forecast for January 1978. (2) The second effort was proposed for award on a fixed price basis. This scope had been released to ARRCOM with award forecast for June 1979.

(U) Modernization of Detonator Facilities - Kansas AAP. The purpose of the detonator projects was to provide production facilities capable of producing nonelectric detonators at the assigned M-Day rates in a safe and efficient manner. Safety would be improved by reducing the quantities of initiating explosives being processed, by eliminating operator exposure and by reducing the number of operators required for processing of explosives.

(U) The following significant events occurred in FY 1977:

a. Project No. 5742634 - this project modernized the back-line at Lone Star AAP (Area P) and was to be a prototype for subsequent modernization projects. McInnis Brothers was the construction contractor and beneficial occupancy occurred in September 1977. However, several construction deficiencies remained that were to be corrected with an FY 1978 late start project. All major items of equipment to support facility operations were delivered and installation was underway. Completion of facility was scheduled for September 1978.

b. Project No. 5782765 - This was an expansion project that was to establish both a front line and back line on Line 4A at Iowa AAP. When complete, it was to have a capacity of 25 million detonators per month. Final construction design was complete in January 1977 and the procurement data package was complete in October 1977. Iowa AAP was continuing with work on a VECP for Manual Explosive Transport Vehicle. If successful, this was to replace the CARTRAC system and capital equipment costs would be reduced by \$3 million. A decision on the VECP was scheduled for April 1978. The construction contract was scheduled to be awarded July 1978 and fiscal obligation June 1978.

c. Project No. 5812702 - This project (Kansas AAP) was originally planned for FY 1978. It was submitted for approval but due to a low priority, it was moved to FY 1981 overprogram.

(U) MMT, Multi-tooled Iowa Detonator Loader - Iowa AAP. This project was initiated in February 1976 to develop a concept and design for multitooling the Iowa Loader. The objective was to improve the

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productive capacity and economy of the existing Iowa Loader, while reducing manpower requirements and utilizing proven technology in detonator loading.

(U) The design effort was initiated by Iowa AAP in March 1976 using omnibus engineering funds in conjunction with facility Project 5782765. Late start MMT funding was approved to accomplish the fabrication, assembly and debug of the prototype loader.

As directed by Selected Ammunition Facilities and Technology Branch, Iowa AAP had designed and fabricated a quad-tooled loader. All the machine components were assembled with the exception of machine guards and shields. All aspects of the computer control had been functioned. Inert debug and testing was begun and no major conceptual problems were encountered. Debugging with live explosives was scheduled to begin in May 1978 culminating in a 100-hour test in July 1978.

(U) MMT - Automated M55 Detonator Production Equipment. This project has been restructured. Efforts directed toward development of a pilot line utilizing a rotary turret design were suspended in FY 1977. Project resources were redirected toward the development of automated ancillary equipment to augment the quad-tooled loader being developed by Iowa AAP. The FY 1979 efforts were to complete development, fabrication and installation of automated equipment modules, and to accomplish equipment and process improvements to the quad-tooled loader based on experience gained in operating the prototype.

(U) MT Development of Automated Process for Fabrication of Grenade Ribbon Assemblies and Prepack of M42/M46 Grenades - ARRADCOM. This project was to design and develop a system to automatically fabricate the ribbon stiffener assemblies and automatically transfer these assemblies to the high speed continuous motion M42/M46 Grenade/Fuze Assembly machine being developed. A second machine was to be developed to prepack the assembled grenades into a ring along with the necessary inert spacers and key for simple layer packing of grenades into the 155mm projectile. A contract was awarded to MB Associates for development of both machines.

(U) CBU Modernization, NAPEC Crane, Indiana. An MMT effort was underway by NAPEC Crane to design and build prototype equipment for the modernization of production facilities for CBU 58/71/75 bomblets. NAPEC completed a TDP for all equipment that was required for a modernized production facility at Milan AAP, excluding melt-pour and downloading operations. The proposed facility required 37 percent fewer operators and produced 30 percent more bomblets per shift. Work was completed April 1977. Approximately \$200,000 in project funds remained after NAPEC completed work. An additional SOW tasked NAPEC for the following: develop a TDP for the CBU 52 production

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line at Milan AAP; develop a TDP for the CBU 25/46 at Milan AAP; generate a modernized CBU 58/71 production line concept for Kansas AAP; develop a TDP for the CBU 58/71 at Kansas AAP; investigate and develop automated riser scrap knockout system; and develop, design and fabricate prototype equipment for handling BLU 63/86 bomblets. It was estimated that this work would be completed June 1978.

Manufacturing Methods & Technology Engineering

(U) Improved Conventional Munition. MMT work concerning ICM production continued. The late start MMT project approved for inertia welding of rotating bands continued to show progress. Chamberlain assembled M483 rounds and these were test fired with encouraging results. A production size machine was being procured for use in a production run. M509 work was begun as well.

(U) A decision to improve our current forging technology rather than adopt the tube extrusion approach proposed was based on requirements and pay back to investment considerations.

(U) Investigation continued for alternate materials for Area Denial Artillery Munition (ADAM) submunition potting to shorten cure time. New material can be cured by ultra violet, reducing the cure time appreciably.

(U) Phase I of the project to look at alternate manufacturing processes for the M42/M46 grenade metal parts was virtually completed. Four contractors produced grenade bodies from alternate processes, including two piece construction and warm-back extrusions. In every case, a cost reduction would result.

(U) Conventional Munition. MMT work involving hot shearing was completed successfully. Work on aqua quench continued. Contracts for M483 and M509 trials were signed with Chamberlain. Initial M509 production at Scranton AAP was to be done using aqua quench after heat treat.

(U) Engineering on tank kinetic energy (KE) ammunition penetrator cores progressed. Work was completed on tungsten core manufacturing processes and information provided to support Government preparation of a description of manufacture. In addition, work was begun on the use of a taper swagging to reduce cost and scrap metal. In this vein, a study concerning the reuse of scrap tungsten alloy material was started. If successful, this would also lower the cost as well as stretch the supply of virgin tungsten.

(U) The depleted uranium (DU) penetrator MMT effort was begun in the areas of the general process (rolling/extruding) and the formation of the buttress grooves using rolling in lieu of machining.

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(U) Small Caliber. An improved cartridge case feeder was developed. At the acceptance test this feeder demonstrated capability of feeding cartridge cases at 99 percent plus efficiency. MMT studies were initiated for determining the optimum process, and equipment for manufacturing cartridge case cups for the SCAMP equipment. In addition, SOW was completed for establishing process and equipment design for manufacturing 7.62mm cartridge case, using the high speed rotary equipment. A second generation of Cartridge Case Measurement and Eject System and Cartridge Measurement and Eject Systems was completed and accepted. These two inspection devices were to be used extensively with the SCAMP Prove-out Program.

(U) Cannon Caliber. A major reduction in requirements for 20mm and 25mm resulted in a redirection of the prototype development program. Work on high speed HEI charge and load and assemble machines was discontinued based on the economies of the lower rates. The fuze to projectile assembly machine had been continued and was to be brought to fruition. The MMT effort was to be directed toward lower rate equipment which would be tooled for 25mm, but from which the technology was to be developed for other items.

(U) Mines. A project to fabricate S&A devices designed during the PEP effort on the XM74 and XM 75 Mines was started in March. This project evaluated the design and manufacturing processes. Indications were that the modified S&A device was satisfactory, that it would have other applications in the FASCAM, and that its use could logically be expected to result in savings in excess of \$8 million.

Modernization and Expansion

(U) 105mm Metal Parts Facility - Lone Star/St. Louis AAP's. The \$110.4 million in FY 1976 funds appropriated for Lone Star remained in a hold status due to Congressional restrictions placed on the project. The major obstacle remained the validation and/or prioritization of 105mm HE mobilization requirements, the bulk of which could go to support of ROKA. During the latter part of the year DA initiated reprogramming actions for the \$110.4 million. Use of some of the funds for a Facility Readiness Project at the St. Louis AAP was considered. A mod (Rehab/Renov) project for St. Louis was developed at an estimated cost of \$13.86 million.

(U) M483 Facilities. The first M483 facility at Chamberlain, New Bedford, Massachusetts was physically completed and rated at 45 thousand per month. A 15 thousand per month facility and a 60 thousand per month facility were begun at Norris Industries, Vernon, California, and Louisiana AAP, respectively.

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(U) M509 Facilities. The first M509 facility at Scranton AAP, rated at 20 thousand per month is about 70 percent physically completed some production of R&D rounds was made on equipment from the new line. A second facility was underway as a result of a 1977 contract, which would be a 30 thousand per month facility when completed.

(U) M42/M46 Facilities. As a result of procurement in 1977 the total base completed or in progress for these items was 13.2 million per month. Because of state-of-the-art advances and competitive procurement, the cost of the grenade metal parts was reduced to the 70 cent area from well over \$1.15.

(U) M735 APFSDS-T Round Facilities. The four contractors for this item (Chamberlain and Flinchbaugh for the projectile metal parts; Kennametal and Teledyne Sterling for the penetrator) had completed a major portion of their facilities.

(U) Small Caliber. A new clipping machine was built but did not perform up to design specifications. Remington was negotiating the procurement for further design work. The results of this work would determine whether the new clipper or a modified old clipper would be used in the SCAMP packaging lines. The cartridge case measurement and eject system were fabricated and successfully completed preliminary testing at Battelle Corporation. Remington let contracts for the process quality control system, automated material handling system, and automated propellant handling system. Negotiations for a primer handling and feed system were delayed due to Buy American regulations. A ballistic test submodule was installed and successfully tested at the Lake City AAP firing range. Only minor modifications were required before it could be used for ammunition acceptance. The groundwork for prove-out was laid with the signing of the Phase III SOW by Remington. This phase covers a 12-month effort in which a fully integrated production line is proven out under a production mode.

(U) A comprehensive SCAMP briefing was presented on May 1977 to technical representatives of NATO countries by the Chief, Metal Parts Division.

(U) Large Caliber Complex. During 1977, engineering review of the process design and equipment specifications was effected by the operating contractors. Interface with the CE was established on construction interfaces, leading to final layouts and final facility design, non-site specific. The project was approved by Congress and signed into law by the President on 21 September 1977. Prior to the approval, the House Subcommittee for Military Construction was briefed on the project with support from OSD, DA, and DARCOM

(U) The first element of site development was awarded in December 1977 to begin the first week in January 1978. Since all facilities had been designed non-site specific, groundwork was laid

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for final site adaption of existing designs through development of soil borings, process layouts, implementation of ECP's and interface with AE's and CE.

(U) Based on the latest dollar estimates and changes in the delivery status of long lead time equipment, the entire implementation plan for the project was revised to make construction of the metal parts building and metal parts support facilities the first priority for FY 1978 and equipment procurement in the forging area the major thrust for FY 1979.

(U) Following the above, it was planned to construct the Load, Assemble and Pack and Cargo metal parts facilities in FY 1980, and complete funding for the entire complex in FY 1981.

Conventional Munitions and Fuzes

(U) Special Studies. During the fiscal year, three special in-house studies were completed for the PM:

Hays Army Ammunition Plant. In early April 1977, this office initiated a study with Frankford Arsenal's Manufacturing Methods and Technology Directorate to evaluate the potential of Hays for 105mm M1 or alternate parts production. Due to fluctuating 105mm M1 requirements, consideration was given to convert Hays to manufacture either 4.2 inch M329A2 or 81mm M374 Shell Metal Parts. During the conduct of the study several visits and meetings were held at Hays with Government and contractor personnel responsible for its current layaway status. The results of the study⁵, completed in August 1977 by the newly formed Army Armament Research and Development Command, indicated that with some modification, Hays AAP should be capable of supporting its mobilization requirements. In addition, the equipment, while not fully evaluated due to funding limitations, should be capable of producing alternate products similar in shape to the 105mm M1.

Munition Base Modernization and Expansion. In late 1977 a special study was conducted for the PM which looked at the Ammunition Production Base Modernization Program from a systems standpoint. The Government investment value was computed in constant FY 1977 dollars. The study was summarized in briefing form and presented to the PM in November 1977.⁶

⁵ Ltr, DRDAR-LCU-P, subj: Hays Army Ammo Plant, Pittsburgh, PA, 16 Aug 77.

⁶ Briefing charts, Munitions Base Modernization and Expansion, A Systems Overview, November 1977, 50 pages.

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Conceptual Methodology for Maintenance and Layaway. This study was conducted to present PBM alternatives to ARRCOM during the December 1977 PBM/ARRCOM Interface Conference. The methodology addressed the need to improve the maintenance of the inactive ammunition production base and delineated techniques for dealing with marginal funding, and selling an improved maintenance program. The study culminated with an outline of the recommended correct action plan sequence.⁷

(U) 155mm, M549 and 8-inch, XM650 RA Projectiles. During March 1977, large caliber facility needs were reviewed to establish what would be required to support the FY 1979 - FY 1983 FYDP as well as to provide production capability to meet the readiness requirements for the rocket assisted projectiles.

(U) The projectile was comprised of metal parts, a warhead and motor body section. Each section was being produced by separate manufacturers with insufficient production capability to meet the FYDP requirements. First, it was established that additional facilities were required to meet production requirements. Then, an engineering design effort was conducted to provide a production line capable of producing both the warhead and motor body sections under one facility as well as determining the feasibility of providing a dual line capability to produce both the 155mm and 8 inch RA projectiles.

(U) The special study was completed and it was established that a facility containing a dual line concept was feasible. A combined line could improve economics and quality assurance by producing the warhead and motor body sections in one facility. This study⁸ was summarized and presented in briefing to PM in September and October 1977.

(U) Modernization Effort for the 155mm Ammo Line. There were six modernization projects in execution for a cost of \$30 million. The bulk of project work modernized 155mm facilities with portions devoted to 175mm/8" facilities. Essentially the modernization effort provided an updated 155mm line by the procurement and installation of new equipment in the following major areas: forge shot, rough turn, nosing, heat treat, and finish turn. During 1977, completion was effected for locating all equipment in place with hook-up under-way and prove-out planned and initiated in many areas.

⁷ Presentation: Concept Methodology for Maintenance and Layaway ARRCOM/PBM Interface Meeting, 19 Dec 77.

⁸ ARRADCOM brief to PM-PBM, subj: Combined Line for Manufacture of RAP 155mm M549 and 8 Inch XM650.

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(U) 81mm Mortar System (L16A2). The United Kingdom's 81mm mortar system (L16A2) was studied for United States use. Lethality testing of ten types of 81mm ammunition was half complete with the following results: HF-1 stress relieved steel (HF1-SR), 102 percent; Pearlitic Malleable Iron (PMI), 100 percent; 1340 steel hot cup cold coin (HCCC), 91 percent; HF-1 heat treated steel (HF-1-HT), 90 percent and DKL15A4 ductile iron, 88 percent.

(U) 105mm M1. The three phase NPI Modernization Program of the 105mm M1 projectile MPTS lines was approaching prove-out. The demonstration test was scheduled for July 1978 with a total of 150,000 units to be run in debug and demonstration test. This program represents PBM's initial efforts at modernizing the private sector and was acclaimed for its success, which included substantial project underrun.

(U) Norris Industries in Vernon, California also had a modernization program. This comprehensive, three-phase program 123 tank cartridge cases, and was valued at \$47 million.

(U) Fuzes. This office participated in a tri-service ad hoc committee for fuzes, and was the responsible organization for preparing the draft Defense Directive on the Policy for Production of Fuzes during R&D. This directive described the programs available and funding levels involved to transition fuzes from development to production.

(U) M739 PD Fuze. The prototype assembly equipment for the M739 PD fuze was completed. This prototype line was being utilized by the contractor for production. These machines were to be duplicated with the result of a balanced assembly line capable of 500,000 fuzes per month, maximum rate.

(U) M567 Fuze. The M567 automated line was installed at Lone Star AAP and was modified to accept the changes imposed by the fuze safety problem. The line was being proven out in a production environment after modifications were complete.

(U) M577/M564MT Fuzes The technology investigation for the M577 Fuze process equipment was completed. Contracts were placed with Bulova Systems and Instrumentation Corporation and Hamilton Technology for one set of prototype equipment designed for balance posing, base rate regulation, and zero setting. Also, one each zero set and two each automatic M564 Fuze regulation machines were designed, constructed, and were in the process of being installed in the production contractor's facility at Westclox.

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(U) XM587/724 ET Fuze. The PEP Study for the automated assembly line for the XM587/724 ET fuze was completed. Also, the automation of XM587/724 hybrid circuit assembly was to lead to reduced cost and higher reliability. This reduced cost was derived by standardizing circuit size, laser scoring and trimming, handling equipment for work in process, and programmable automatic wire bonders. Automation was to significantly lower hybrid microcircuit cost through the lower labor costs resulting from automation and high yields made possible by machine reproducible processing.

Washington, DC Field Office

(U) Single Manager, In-Process Review. Single Manager IPR was presented to acting Assistant Secretary of the Army (I&L), Mr. Greiner, on 16 February 1977, at the Pentagon. Secretary Greiner emphasized:

Inventories scheduled for transfer from Navy to Army should be closely checked to insure validity of quantities on hand, and so obviate any shortages which the Army would then be required to fund.

The Army should take credit for all recommendations made which would contribute to greater efficiency. Additional funds for demilitarization (O&MA) were a problem. Any Navy program or procedure that showed merit should be suggested for adoption by DARCOM; the subject of conversion of Navy plants from GOGO to GOCO was not advisable at that time.

(U) The subject of one Inventory Control Point versus separate service ICP's was discussed in some detail with no resolution. It was referred to OSD for decision. Major General Eicher summarized results as progress was made, higher level assistance was not required at that time. No problems or developments surfaced which affected PBM.

(U) Prove-Out Briefing. On 24 February 1977, the PBM Prove-Out Briefing was presented to Acting Assistant Secretary of the Army (I&L) Greiner. Mr. Greiner was quite complimentary on the organization of the briefing and the excellent manner in which it was presented. He directed the inclusion in the briefing of the penalties to be paid if prove-out were not accomplished. The briefing was presented to Principal Assistant and Deputy for Acquisition ASD (I&L) Trogdon on 25 February 1977. Mr. Trogdon approved the PBM prove-out concept and stated that ASD (I&L) would support the plan should it be questioned from any source.

(U) Rotary Forge Briefing. PM personnel attended presentation by representative of GFM Corporation, Steyer, Austria. Purpose of the briefing was to advise DARCOM, DA, and DOD representatives of

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technological improvements incorporated into latest versions of GFM rotary forges and other metal forming equipment. These machines produce gun barrels cheaper, better and in much greater quantities than the US counterpart machines. A considerable amount of their equipment was purchased by the USSR. It was estimated that the USSR capacity for weapons production exceeded that of the US and was steadily growing. A study was underway at Rock Island to assess the GFM process for gun barrel production. The rotary forge at Watervliet was a GFM product.

(U) VIPER RECAP. VIPER RECAP was on 22 March 1977. Principal items of interest to PBM concerned, (a) statement that \$20 million of the total \$201 million program was production base support, however, the Carborane facility was not discussed, (b) MG Hunt stated that in his opinion, the VIPER was designed to "kill the Russian T-55 Tank" which was 20 years old, rather than addressing the modern version of the T-72 or even T-80. AMSAA representative supported the PM position that VIPER was effective against the T-72. MG Hunt was not convinced, (c) VIPER target design to unit cost was stated to be \$83.03 to include \$9.00 Carborane cost. However, analysis of total requirements versus costs indicated that target was low and did not include R&D costs. PM was requested to recalculate numbers and advise the DCGMD.

(U) Management of AAP's Study. Per letter of 7 March 1977 MG Eicher, CG, ARRCOM requested comprehensive authority to manage AAP's be delegated to his command. He requested that an Army Regulation be published which would exempt AAP's from complying with numerous regulations and directives which were designed for conventional military posts, camps and stations. Response to MG Eicher's request was contained in letter, 6 May 1977, signed by James Maclin for LTG D'Ambrosio, and forwarded to PBM under separate cover. Response requested that specific regulations in question be identified with rationale for exemption and be addressed on individual basis. Separate exemption AR was not favorably considered.

(U) Industrial Base Planning Conference. ADPA IBP Conference was held at Cleveland, Ohio on 28-29 April 1977. Principal items of interest to PBM concerned new initiatives in Industrial Base Planning and Surge Capability under the DOD IP Program. The GAO Report on Industrial Base Planning was not presented due to its not being released for publication in time. Also, the first increment of the commodity sector assessment program (aircraft) was not presented. Conferencees were disappointed at the absence of those two critical interest items. Other presentations included the industry view of Industrial Base Planning, plus the Air Force, Navy, DLA and Maritime briefings on IPP related subjects. COL Rudrow presented "Requirements, The Planned Producer and Future Trends."

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(U) Major items of interest to PBM included containerization at plant locations and establishment of an "Ammunition Czar" to integrate development, production, logistics and combat readiness. Containerization was discussed with reference to size, type and transport of containers but did not address their use at plant locations. Major area of discussion centered on forward area ammunition supply with emphasis on packaging to permit easy access by user. "Ammunition Czar" was discussed with consensus that there was no requirement for such a position.

(U) It was agreed that adequate control existed in DA, DCSRDA, SM for conventional ammunition and other key ammunition positions. There may have been long term effects from the AITF which could have impacted on PBM some time in the more distant future. Guidance and decisions of the AITF were to be finalized and furnished. A "murder" board was to be convened in June/July 1978 to prepare the briefing to Vice Chief of Staff, General Kerwin.

(U) Ammunition Initiatives Task Force. Colonel Hukkala, Task Force Chief presented an AITF briefing on 12 July 1977 to Generals Guthrie, Sammet, D'Ambrosio, Hunt, Eicher, Lewis, and Egbert. Commanding General questioned why AITF project was being handled through DCSOPS channels rather than DCSLOG, in view of its obvious logistical aspects. MG Hunt stated that General Kerwin evidently assigned action to operations channel rather than logistics, however DCSLOG personnel were involved in team study efforts. General Guthrie did not agree with consumption, distribution surge rates--considered them unrealistic, unmanageable, and not "real world." The CG suggested rates be challenged. Also General Guthrie noted that study addressed all conventional ammunition but excluded mines and air defense weapons ammo. CG concern was that mines constituted considerable lift tonnage, and therefore ammunition company requirements (41) were understated, as were lift requirements. The Commanding General took issue with DARCOM "intensive" management recommendation with regard to rough terrain fork lifts on ground maintenance problems of RTFL's had not been specifically identified. He stated that until problems had been isolated that IM would not be solution to problem.

(U) Single Manager for Conventional Ammunition. Telephonic version of press release was furnished members of Congress regarding announcement by Secretary of Army of official designation of Commander, ARRCOM, to perform SM mission. Announcement addressed transfer of McAlester and Hawthorne to Army on 1 October 1977 as Army Ammunition Plants and activation of an Army Ammunition Activity as a tenant unit at Crane on the same date. To support the management function, Navy was to transfer 100 personnel spaces, and Air Force 13 personnel spaces to SM ARRCOM Headquarters at Rock Island, Illinois. Two Navy military commanders and 272 Marine security guards at Hawthorne and McAlester were to be transferred to new assignments. Remaining personnel affected by SM mission were to be reassigned in place.

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DCS (Army) Communications Systems Project

Background

(U) US Army Communications Systems Agency (USACSA)/DCS (Army) Communications Systems Project was established in 1967 as a joint US Army Materiel Development and Readiness Command/US Army Communications Command (DARCOM/USACC) project management activity at Fort Monmouth, New Jersey, with the full-line authority of Commanders of both DARCOM and USACC.

(U) The USACSA Commander, as the Project Manager DCS (Army) Communications Systems, reported directly to the Commanding General, DARCOM, concerning management of those functions derived from AR 10-11 (R&D, planning, product assurance, configuration management, type classification, materiel management, integrated logistics support, production, engineering, initial production facilities, procurement and production, and distribution). As the Commander of the USACSA (a major sub-command of USACC), he reported directly to the Commanding General, USACC, concerning management of those functions derived from AR 10-13 (systems engineering, programming and budgeting, overseas contract administration, installation, on-site test and acceptance).

(U) A 1971/72 DA-directed study resulted in the "triple-hatting" of the USACSA Commander/Project Manager as the Commander, US Army Communications-Electronics Engineering Installation Agency (USACEEIA). In this capacity, he was responsible for detailed system engineering, installation, test and acceptance of worldwide systems, Army-wide telecommunications automation development and maintenance, worldwide radio propagation engineering services, and Army-wide electromagnetic compatibility engineering services.

(U) Because of the dual nature of this activity's name; i.e. US Army Communications Systems Agency (USACSA) and DCS (Army) Communications Systems Project, USACSA and DCS (Army) CS Project Management Office were used interchangeably throughout this history.

Mission

(U) The mission of the DCS (Army) CS Project Management Office/USACSA, with Brigadier General Emmett Paige, Jr., as its Project Manager/Commander, was stated in its charter dated 14 November 1976, and signed by the Secretary of the Army. Briefly paraphrased, the document centralized management of (1) specified communications systems development and/or acquisition tasks assigned by DARCOM and (2) tasks assigned by USACC which included Defense Communications Systems (DCS) projects assigned to the Army, projects that related to purely Army requirements, to requirements for other US military departments and non-military US Government agencies, as well as requirements for allied armies and governments.

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The Product

(U) Essentially, the agency's product is nontactical telecommunications projects assigned to the Army for acquisition. These can be either Research and Development or Systems/Equipment Acquisition.

(U) Research and Development. R&D projects were assigned to the agency by DARCOM, which also provided the appropriate RDT&E funds. The projects usually consisted of feasibility studies and similar undertakings, and were assigned to this agency's R&D Management Office.

(U) Systems/Equipment Acquisition. This type of project represented about 95 percent of the agency's workload, and nearly all of these tasks were assigned to Deputy Project Managers (DPM's). These tasks ranged from the acquisition of a single piece of equipment to the acquisition and installation of an inter or intra country, or even global telecommunications system.

(U) Practically all systems/equipment acquisition tasks were assigned to the agency by USACC, who also provided the appropriate funds. It was normal USACSA practice to acquire, deliver and install these systems/equipments through contracts with US industry, using the existing DARCOM procurement office organizations (principally USAECOM), as well as other DOD procurement offices as the peculiarities of an individual task dictated. Further, systems/equipment acquisitions were fulfilled by what was called off-the-shelf equipment, meaning existing equipment in industries' or the Government's inventories, or by modifying existing equipment for a specific telecommunications system or purpose.

(U) USACSA did not own any telecommunications systems or equipment assets. Instead, it acted as an agent in the sense that it acquired and installed systems/equipments, and once the system/equipment had been accepted, turned the system/equipment over to the local O&M Commander. It then became part of his inventory.

(U) On the average, about 50 new tasks were received and a similar number completed or transitioned each year. At any given time there were about 150 active tasks on hand.

(U) During FY 1977, 78 new tasks were received and 50 were completed or transitioned. At the end of the fiscal year, 165 active tasks were on hand, 87 of which were classified as major, requiring intensive management. The FY 1977 R&D program consisted of nine tasks with a value of \$3.1 million. In the course of implementing these, all disciplines in the communications-electronics field were used because the USACSA was involved in virtually every area for which USACC was responsible, except the operation and maintenance of facilities.

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practically every means of transmission was employed, such as microwave line-of-sight, troposcatter, satellites, land and sea cables, and high frequency radio. These means were used to furnish all modes of communications such as voice and data. Computer processor controlled automatic switches and terminals were also employed in many subsystems, and the agency was deeply involved in the improvement of Army Air Traffic Control facilities at airfields in the Pacific, Europe, and CONUS.

USACSA's Organizational Structure

(U) During 1977, the agency's organization structure remained unchanged except for a few minor adjustments.

(U) With the establishment of the provisional USACSA organization, the Product Assurance Office was designated a division within the Procurement and Product Control Directorate. The reorganization consolidated the chain of command. The Product Assurance Office continued to provide support to the Deputy Project Managers (DPM), Product Managers, and directorates in the areas of quality assurance, test and evaluation, reliability, maintainability and human factors. Also, the reorganization established the Product Assurance Office as responsible for system safety, production engineering and environmental quality considerations.

(U) The Configuration Management Office was also designated a division within the Procurement and Product Control Directorate. This division continued to develop, implement, and manage the agency's configuration management and value engineering programs.

(U) At the close of business on 30 September 1977, the combined authorized and assigned military and civilian personnel strength of the USACSA/DCS (Army) Communications Systems was as follows:

Personnel Strength (As of 1 October 1977)

| | DARCOM | | | | USACC | | | | TOTAL | | | |
|------------|--------------|---|-----|-----|--------------|----|-----|-----|---------------|----|-----|-----|
| | O | E | C | T | O | E | C | T | O | E | C | T |
| Authorized | 14 | 7 | 12 | 142 | 30 | 62 | 142 | 234 | 44 | 69 | 263 | 376 |
| Actual | 9 | 7 | 119 | 135 | 26 | 49 | 131 | 206 | 35 | 56 | 250 | 341 |
| | O - Officers | | | | E - Enlisted | | | | C - Civilians | | | |
| | | | | | | | | | T - Total | | | |

Obligation of the USACSA Funding Program

(U) The Other Procurement Army (OPA) Program remained the major resource of the USACSA Project Manager. In FY 1977, the total Army and customer program was \$129 million. The Army Airfield appropriation amounted to an additional \$3.0 million, while Direct

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Cites of Customer Orders added \$13 million, for a total procurement program of \$145 million. Management of miscellaneous O&MA requirements accounted for \$15 million more which established the overall total for acquisition of items in support of USACC at \$160 million. Of the total, 55 percent was awarded during the fiscal year; this percentage was similar to obligation rates for the past fiscal years. Major items such as Pentagon CTCC, Selective Release Improvement Program, (SELRIP), Secure Voice Phase II, Power Generators, and Satellite Interconnect Facility underwent major realignments during the year which prevented execution of larger segments of the program.

(U) The OPA Program for the next five fiscal years indicated that there were to be updates in existing programs such as AUTODIN, AUTOSEVOCOM, Transmission Media, and WWTICIP. It continued expansion of projects in the command and control area such as AUTOSEVOCOM II, Alternate National Military Command Center (ANMCC), Army Telecommunications Automation Program (ATCAP), National Military Command System (NMCS); and the acquisition and installation of large systems for foreign governments such as Saudi Arabia, Spain and Indonesia.

(U) A special MAP FMS and Grant Aid Status Report, under development during FY 1976/7T, was completed in FY 1977. All actions initiated against each RCN or Case were identified, listed by PRON, and status reported. The report also informed all pertinent activities about the type of financial transactions occurring.

Cost Analysis

(U) During FY 1977, the Cost Analysis Office concentrated its efforts in system equipment cost estimates, economic analyses, contractor cost reporting, review of contractor cost proposals, and cost assessments.

(U) The most notable effort for FY 1977 was the participation by this office in the development of an independent parametric cost estimate (IPCE) of the AN/TTC-39 switches. The IPCE was the first ever developed by USACC and the USACSA Cost Analysis Office was given total responsibility for the investment phase of the life cycle.

(U) Other system/equipment cost estimates developed during FY 1977 included the Efficient Reliable High Powered Amplifier, Saudi Arabia Delta Net, Automatic Terminal Information System (ATIS) and the Terminal VHF Omni-Range Equipment (TVOR), Worldwide Military Command and Control System, and AN/FRC-155 Radio Modification.

(U) In the area of economic analysis, the following studies were completed: Modems - A Government versus contractor maintenance study on the modems being procured to support the AMME Standard Remote

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Terminals; IBM Magnetic Card Machines - To determine whether retention of these machines can be justified on the basis of use; High Speed Digital Secure Facsimile Terminals - A lease versus buy study on four alternatives; Xerox Machines - Various quantities and models of Xerox equipment were analyzed; and TELEX Machines, Fort Ritchie - Lease versus buy analysis.

Manpower Management

(U) Significant management tools were developed in this area that provided accurate up-to-date weekly status of man-years, numbers of senior level positions, and average grade. All data was collected on a weekly basis, then combined with projections computed from all available information, and accurately portrayed on a graph. This graphic analysis provided the current circumstances on man-years, senior level positions and average grade. It also indicated when and how circumstances would be altered by known gains and losses. "Cure" paths were then plotted which allowed full utility of authorizations to meet headquarters imposed ceiling/limits.

(U) The graph provided management with a complete overview of the current year's experience, current conditions, and what had to be done during the balance of the fiscal year. From this overview was derived specific personnel actions and their effective dates.

(U) The importance of this management procedure grew with each successive cut-back in manpower levels, and the increasing frequency of headquarters' directed ceilings. In addition, it maximized full utility of authorized man-years, executive positions, and average grade.

Management Information and Control Systems

(U) During the first quarter of FY 1977, the planned conversion of USACSA's project management control system (CSA-PERT) from the host installation's dedicated computers to a service bureau type of operation was accomplished. The goal of conversion was to provide more responsive turn-around for USACSA action officers via the much more efficient computers available at the new center. Also, the center supported remote terminal access. This added dimension proved fruitful not only for CSA-PERT, but also provided the key for convenient and efficient means to expand both management and business data processing applications.

(U) The management applications of the expanded capabilities included the CSA-PERT reports and graphics interface programs (at Fort Monmouth) were upgraded, decreasing turn-around time by a minimum of 50 percent; and concurrently with the above action, the equivalent project management systems in use at Fort Huachuca were extensively modified to provide specialized reports tailored to USACSA action

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officer's needs; also, the USACSA Project Summary Report (PSR) was automated and subsequently an interface was developed to make graphics available as ancillary support to the PSR. In late FY 1977, initial efforts were begun on a TMDE management control system for Product Manager for (DCS) Army Equipment. The concept was to provide an audit trail for TMDE inventory, procurement lead times, costs, etc. It was anticipated that this system was to be operational early in 1978.

(U) During the third and fourth quarters, we participated in an exercise to establish a direct computer link from USACSA via terminal to SAAD to support a planned BOM Status Report which was being developed by SAAD for USACSA Logistics. The direct link had been delayed by hardware problems related to an equipment upgrade at SAAD; however, the interim support was being provided by a combination of the AUTODIN and our remote terminal.

(U) Several business applications could be incorporated within a service bureau type of operation. With availability of direct user to computer operations, the OPA Report (formerly PEMA) was expanded to cover more areas. Two new systems were developed to support USACSA financial operations - a travel report and a Military Assistance Program (MAP) report. The travel report tracked the total TDY costs by organizational elements and provided each activity with a list of travel orders processed and the balance of travel allocations remaining. The MAP report provided an audit trail for requisitioning of code numbers (RCN) and cases for foreign military sales. It listed every document committed against the case and the balances available for commitment, and was used by the DPM and the JUSMAGS. An abbreviated contract listing was under development. Efforts were planned to augment this with applicable information from the DARCOM ALPHA data files at the earliest opportunity.

(U) The existing limited terminal was being upgraded with a mini-computer which would not only provide more efficient remote batch operations, but was field-expandable to a distributed processing management information system environment.

(U) The computer center at Fort Monmouth upgraded and subsequently augmented their capability. As part of this upgrade, they acquired the DARCOM Standard Data Base Management System (System 2000). The combination of this and the expected USACSA terminal upgrade would provide USACSA with the capability to consolidate many of the existing separate data files into a central data base. This would be accessible from local "screen-type" terminals. Thus a "real-time" management information system would be available to USACSA managers.

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Type Classification/Reclassification Program

(U) During the period 1 October 1976 through 30 September 1977, formal type classification/reclassification In-Process Reviews (IPR) necessitating preparation of IPR agenda packages continued to be scheduled. Since the implementation of the formal type classification/reclassification IPR procedures in FY 1974, written concurrences had been received from the IPR members for all USACSA proposals, and was not necessary to convene a formal IPR.

(U) In FY 1977, USACSA type classification actions for 682 systems/equipments and reclassification of 78 equipments were recorded and broadcast by the US Army Development and Readiness Command, Materiel Status Office. The schedule for type classification reflected 59 systems/equipments which would require scheduling of formal IPR's during FY 1978. Equipments required for such major programs/systems as Worldwide Technical Control Improvement Program, additional configurations of the DCS Microwave Radios, European Telephone System (ETS), Digital Radio and Multiplex Acquisition (DRAMA), Digital European Backbone (DEB), were included in the current schedule.

(U) The Value Engineering Company continued to provide contractual effort to perform the research and obtain the technical data required to prepare the IPR agenda packages and prepare nomenclatures due to limited personnel resources. During FY 1977 the expenditure for the effort was \$130,000.

Product Improvement Program

(U) The product Improvement (PI) Program, established by AR 70-15, provided the procedures for obtaining approval and funding for configuration changes which involved substantial engineering or modification of existing fielded Army/Tri-Service equipment, type classified standard or limited production. The PI of existing fielded equipments were initiated to accomplish the following objectives: satisfy user requirements; correct proven performance deficiencies; insure safety of personnel, prevent damage to equipment through operational usage; improve reliability, availability, and maintainability (RAM); significantly reduce production costs and/or logistics support requirements; and make significant simplification standardization, environmental or compatibility changes in design.

(U) Product Improvement Programs currently implemented in accordance with AR 70-15 included:

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Digital Subscriber Terminal Equipment (DSTE) Product Improvement Program. Under the DSTE Upgrade Program, General Dynamics Corporation was awarded a contract in March 1975 to provide three DSTE product improvements under the DARCOM Product Improvement Program. The three DSTE PI programs were approved by DARCOM for implementation to accomplish (1) Provide improved tape supply slide for low/high speed paper tape punches, scheduled for field application during FY 1978; (2) provide cooling fan for the low speed paper tape punches, scheduled for field application during FY 1978; (3) provide clutch bank test fixture for depot repair of clutch bank assemblies, u/w high speed/low speed paper tape punches which were implemented and completed during the first quarter of FY 1975.

(U) Low Level Conversion Program. This product improvement provided for the modification of several types of Kleinschmidt Teletype (TTY) equipment installed in communications centers, to operate in a low level signal mode, thus preventing emanating signal transmissions. The TTY Low Level Conversion Program was an ongoing PI program scheduled for completion in FY 1978.

(U) AN/GSQ-166 Upgrade. The AN/GSQ-166 was a transportable Technical Control Facility (TCF). Proposed modification would improve/expand mission operation and circuit monitoring capabilities of all AN/GSQ-166 TCF's. Application by depot was scheduled for implementation during the first quarter of FY 1979 and completion by the fourth quarter of FY 1980.

(U) AN/MSQ-73 Upgrade. The AN/MSQ-73 was a transportable Technical Control Facility. Proposed improvement would standardize operational procedure in all AN/MSQ-73 TCF's and provide better reliability and maintenance. Application by designated depot was scheduled for implementation during the first quarter of FY 1979 and completion by the fourth quarter of FY 1980.

(U) AN/TGC-39(V)2 Upgrade. The AN/TGC-39(V)2 was a dual teletype terminal housed in a S-280 transportable shelter. Proposed modification would improve mission operation and increase maintainability/reliability by low-level modification to existing AN/FGC-25X TTY's and removal of AN/UGA-8 converter units would also improve patching capability with the addition of quick disconnect connectors. Application by depot was scheduled for implementation during the first quarter of FY 1979.

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(U) AN/GTC-29(V)2 Upgrade. The proposed modification of this transportable automatic voice switching facility (AVSF) would provide for the installation of line conditioning equipment for 20 circuits in the AVSF and improve reliability and quality of transmission with technical controls and other communications facilities located some distance away. Application by Army depot scheduled for implementation during the first quarter of FY 1979 and completion by the first quarter of FY 1980.

(U) AN/TSC-38B Upgrade. This communications central housed in a transportable shelter consisted of four functional subsystems: radio subsystem, telephone subsystem, voice frequency telegraph subsystem and teletype subsystem. The proposed modification would provide the subsystem to prevent emanating signal transmission, an improved high frequency (HF) antenna system to meet all contingency operations, provide a spectrum analyzer for transmitter tuning, recabling and equipment standardization to improve reliability/maintainability. Application by a designated Army depot scheduled for implementation during the first quarter FY 1979 with completion by the fourth quarter FY 1982.

(U) AN/TSC-25 Upgrade. The AN/TSC-25 was a communications central, housed in a transportable S-141 shelter. It functioned as a high frequency radio set which provided the transmission media for teletypewriter and voice communications. The proposed modification would provide low-level signalling capability to existing teletype, replace/rehabilitate antenna mast AB746, to improve received signal levels at antennas, and to insure mission operation/capability.

Product Manager DCS (Army) Equipment

(U) In December 1976, the Office of the Product Manager DCS (Army) Equipment was established. Reporting directly to the Project Manager, this office provided the command with a centralized management point for all major projects and selected major projects requiring intensive management, management and acquisition of test measurement, and diagnostic equipment (TMDE) in support of USACC mission requirements, and management during the transitional phase of the termination of centralized management of selected major projects.

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(U) Mission responsibilities assigned to the Product Manager DCS (Army) Equipment were primarily diversified unique tasks requiring project/intensive management, or involved intensive coordination with other commands, activities, and industry to insure that the acquisition and fielding of common equipment having multiple deployment was managed in the most cost effective and time responsive manner. The flexibility of this office in responding to the variety of assigned projects was exemplified by such diversified tasks as acquiring a specialized non-standard antenna system, managing the DA Worldwide Low Level Teletypewriter Conversion Program, and managing the required planning actions for the replacement of approximately 2000 obsolete fixed station teletypewriters with new solid-state teletypewriter terminals.

(U) Sufficient progress had been realized in the centralized management and acquisition of TMDE during the past year. Over 1000 line items of TMDE were placed under intensive management, and approximately \$4 million of TMDE was acquired during the fiscal year. Substantial dollar savings were realized through elimination of duplication or non-essential TMDE, or through standardization of TMDE requirements. In January 1977, the Product Manager was designated to represent the Commanders, USACC, and USACSA on the Department of the Army Automatic Test Support Systems (ATSS) task force. As a result of the task force's efforts, actions were initiated during the third quarter of the fiscal year to plan and budget the acquisition of four sets of Automatic Test Equipment (ATE) for USACC; two units of ATE were to be for the Special Repair Activities (SRA) to be established by USACC in CONUS and Europe; and two sets were to be provided as government-furnished property (GFP) for communications-electronics (C-E) systems contractors.

(U) In addition, the Product Manager served as a primary point of contact for task/programs which had progressed to the post-IOC phase and the remaining management effort which was predominately the transfer of residual logistics support management responsibilities from the project manager to the responsible DARCOM commodity command systems support manager or product manager. At the close of the fiscal year, 13 projects/tasks were in the transition and/or close-out phase.

Product Assurance

(U) The primary Product Assurance Division project involvement started with the review of the project tasking Communications-Electronics Mission Orders (CEMO's) and continued through the materiel acquisition cycle to Government acceptance of the contractor's supplies and services.

(U) Major activities involved technical specification, statement of work, and purchase description reviews, procurement requirement package preparations and contractor technical proposal evaluations, each emphasizing the quality assurance provisions, reliability and

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maintainability (RAM) and testing requirements. Continuous coordination was maintained with each DFM and Product Manager. During the contract administration phase, contractor submitted inspection (test) procedures and RAM predictions were evaluated, first article inspection results analyzed and appropriate plant and site contacts, including visits, made to survey the contractor's QA efforts, as a joint effort with the delegated Contractor Administration Quality Assurance representative. The following projects required and received extraordinary emphasis: DRAMA, TAEMS, AUTODIN II, Air Traffic Control (ATCCS, TVOR), COMFAC, ETS, AN/FTC-31 Enhancement, SELRIP, WAWS, Saudi Arabian Delta Net, and the Pentagon Consolidated Telecommunications System.

(U) In addition to project-oriented efforts, the Product Assurance Division provided an agency focal point for interpretation and implementation of testing policies issued by Department of the Army, USACC, and DARCOM. The most significant events were the issuance of AR 71-3, (User Testing) effective 15 April 1977, and the preparation of a draft USACC supplement. These publications permitted continuous comparison with requirements in AR 70-10 (Test and Evaluation), implementing development and operation testing requirements, effective 1 January 1976.

(U) As a direct result of the assignment of production engineering surveillance to Product Assurance Division, the USACSA input to the USACC AMP budget submission was prepared, coordinated and provided to Headquarters, USACC. This submission established the required production and administrative lead times associated with contractual actions.

Research and Development

(U) During FY 1977, as it did for the past ten years, USACSA R&D maintained its close cooperation with ACC, DARCOM, DA and DCA in the development of near term and long range RDT&E projects in support of Army communications and Army assigned portions of the Defense Communications System (DCS). These efforts included participation in the preparation of the DA Telecommunications Plan (DATEP) 2001 and inputs to and review of the DCA Five-Year Plan (FYP) - 1979. Based upon these documents and other specific tasking documents, this agency, representing the materiel developer, DARCOM, prepared the appropriate technical and costing portions of the requirements documents.

(U) These requirements documents fell under four categories: Joint Operational Requirements (JOR), Required Operational Capability (ROC), Letter of Agreement (LOA), and Letter Requirement (LR). Initial preparation of these documents fell under the jurisdiction of USACC. Technical and cost assessments were prepared by USACSA and validated by the USAECOM Cost Estimating Control Data Center.

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(U) AUTOSEVOCOM II Access Area Design. A design report was prepared that detailed the implications of AUTOSEVOCOM II for the access area. The report summarized the AUTOSEVOCOM objectives for 16 kbs continuously varying slope delta (CVSD) voice digitization and distribution to up to 10,000 subscribers worldwide. It analyzed the currently available and emerging digital transmission facilities and proposed specific approaches to inter-connect the widely dispersed subscribers. There appeared to be no major technical obstacles, but the cost of the transmission facilities could be beyond the reach of many of the proposed subscribers.

(U) Washington Area Secure High Speed Facsimile Terminal (WASHFAX IV). This R&D task was undertaken to develop an improved WASHFAX capability providing high resolution, grey scale, and color. WASHFAX III, which was fielded during FY 1977, has a resolution of 200 lines per inch and provides no grey scale or color. WASHFAX IV successfully developed a system capable of 400 lines per inch resolution, and 16 levels of grey scale or color. Implementation of these improvements will depend on the specific requirements of individual WASHFAX subscribers and their ability and willingness to pay for these improvements.

(U) Megabit Digital Troposcatter Subsystem (MDTS). The MDTS program comprised the development, fabrication, test, and evaluation of eight engineering development models of a digital modem, for the transmission of digital signals over DCS troposcatter transmission links. A contract for this task was awarded to GTE Sylvania and Signatron, Inc., in November 1973. The successful test proved a technological breakthrough in digital troposcatter transmission by employing adaptive decision feedback equalization on the received signal. Transmission of bit rates of 12.6 megabits per second over a distance of 150 miles or 6.3 megabits over 250 miles with low error rates was possible.

(U) During FY 1976, eight engineering development models were fabricated and tested. Successful testing was accomplished via both simulator and test link (Rome Air Development Center (RADC), Verona, New York, to Youngstown, New York, 168 miles). The contract was modified for a Performance-Improvement Program (PIP) for the purpose of enhancing the MD-918()/GRC and preparing it for comparison with the USAF developed DAR-4 (Raytheon).

(U) During FY 1977, the eight modems were upgraded per the PIP. MD-918()/GRC's were used for the DCA comparison testing (MD-918 vs DAR-4) part of the US/NATO test program. Testing was accomplished between January and August 1977. Two NATO links were used for the test; Feldberg, FRG-DASSO Dei Galli, Italy, and Feldberg-Kindsback, FRG. While the MD-918()/GRC has a maximum data rate capability of 12.6 mbs, the testing rates for the MD-918()/GRC were limited to 3.2, 6.3 and 9.4 mbs. On the Feldberg-Dasso Dei Galli link at 6.3 mbs, the mean bit error rate was better than 10^{-5} for 99.99 percent of the test period

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in quad diversity. Better than 85 percent of all MD-918()/GRC test seconds were error free at 6.3 mbs. It was the intention of DCA to write a production performance specification based upon overall test results obtained on both the MD-918()/GRC and the DAR-4.

(U) Efficient Reliable High Power Amplifier (ERHPA). This program was concerned with the development of an ERHPA for use with existing and future digital troposcatter transmission systems. An improvement in efficiency and reliability was necessary to reduce operational and maintenance costs. To meet cost reduction goals, the area of design emphasis must be placed on the klystron tube and cooling system to be used in the desired ERHPA. A sole source contract was placed in FY 1976 with Varian Associates, Palo Alto, California, for the design of klystron tubes for L-Band (755-985 MHz), S-band (2.5-2.7 GHz), and C-band (4.5-5.0 GHz) and a compatible cooling system. Additionally, four C-band klystrons and two cooling systems were to be fabricated and tested on this contract.

(U) During F& 1977, this agency became aware of the development of the AN/TRC-170 radio terminal set, (same C-band (4.4-4.0 GHz), by TRI-TAC) through Air Force. The High Power Amplifier (HPA) of the AN/TRC-170 was sufficiently close in essential parameters to DCS requirements to make it a viable candidate and worthy of consideration on the basis of military commonality advantages. However, for technical reasons, the AN/TRC-170 HPA could not use the C-band klystron being developed by USACSA. Based upon the AN/TRC informational input the CSA developmental direction was changed in the following manner: (1) the Varian Associates' contract was modified to delete the fabrication and testing of four C-band klystron tubes, and four S-band klystron tubes were to be fabricated and tested, (2) a life cycle cost analysis was being conducted in which the AN/TRC-170 HPA, and commercial HPA's for all three bands (C, S, and L) will be candidates. On the basis of the cost analysis a final determination will be made as to what HPA's will be most efficient, reliable and cost effective.

(U) Adaptive Antenna Control(AAC) System. The AAC System program was concerned with the development of an automatically controlled antenna system which would maximize the received RF signal in diffraction and troposcatter radio links. Existing links suffered the effects of substantially degraded service, and sometimes, "outages" caused by variations in the angle of arrival of the received beam. This condition, caused predominately by the time variations in the atmospheric index of refraction profile and altitude, would be minimized by the incorporation of the AAC System with the existing links. A competitively negotiated contract was placed, 25 June 1976, with Signatron, Inc., Lexington, Massachusetts, for the design and fabrication of an AAC System based upon angle diversity and predetection combining.

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(U) Transportable Automated Electromagnetic Compatibility Measurement System (TAEMS). The TAEMS was a measurement system for automatic monitoring, detecting and analyzing of electromagnetic signals and radiations from 20 Hz to 40 GHz. TAEMS was composed of four major subsystems: (1) the antenna subsystem with 2-40 GHz microwave down-converters, (2) the automatic spectrum analysis receiving subsystem, (3) the control and data processing subsystem, and (4) environmental control subsystem. The automatic spectrum analysis receiving and the control data processing subsystems were based on the Hewlett-Packard ARS-400 automatic spectrum analyzer. A 20-foot, self-propelled van, data acquisition van, housed the ARS-400 antenna subsystem, and collapsible antenna tower. Another 20-foot, self-propelled van, maintenance and calibration van, housed test measurement and diagnostic equipments, manuals, and spare parts. Each van had two 6.5 kilowatt generators and interior environmental control equipment.

(U) The FY 1977 achievements for the TAEMS development program included the completion of RTE operating software system, incorporation of the time compression technique for 20 Hz to 10 kHz signals and development of buss structure interface equipment for interfacing the HP ARS-400 and the remote 2-40 GHz front end. Also completed was the fabrication of the 2-8 GHz, 8-18 GHz, 18-26 GHz and 26 to 40 GHz pre-selector/downconverter modules. This effort had advanced the state-of-the-art in automatic spectrum analyzers. The TAEMS developed DT II and DT III and the 300-foot extension capability were to be completed in FY 1978.

(U) USACSA Field Office - Europe. The Chief, European Field Office (EFO) represented the Commanding General, USACSA/Project Manager DCS (Army) Communications Systems in Europe. In that capacity, the Chief of EFO was responsible for monitoring, coordinating and implementing the following major systems/projects. Following is a brief summary of representative EFO actions for FY 1977.

(U) Defense Satellite Communications Systems (DSCS). The AN/FSC-78 terminal at Menwith Hill Station in England was successfully installed and cut over to live traffic in June 1977. The European Field Office (EFO) participated actively in the planning and implementation stages of this project. In addition, the EFO effected coordination between major commands and offices (customer) concerned and assisted materially in getting this terminal operational on the Initial Operating Capability (IOC) date.

(U) The Landstuhl FSC-78 terminal was progressing toward Joint Beneficial Occupancy Date (JBOD). Active assistance was provided by the EFO toward installation of this terminal, thereby allowing contractor personnel to devote more time to their actual duties. Moreover, this EFO, through direct coordination with the contractor at Palo Alto, California, arranged fast release of customs documents for incoming

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shipments by commercial air and sea transportation. In performing this function, the EFO eliminated costly delays by having custom documents in the hands of the receiving agency at the same time the shipments arrived in country.

(U) AUTODIN Automatic Switching Centers (ASC's). The EFO provided a participant to a logistical evaluation team which visited ASC's at Coltano, Italy, and Pirmasens, Germany. At the completion of the evaluation visit, the EFO provided administrative assistance to the team in making up the final draft of the findings of the team.

(U) During hazardous conditions (HAZCOM) experienced at both the ASC's at Coltano and Pirmasens, the EFO took active participation in coordinating visits of TOAD assistance teams and expediting shipment of equipment and materials.

(U) Automatic Secure Voice Communications (AUTOSEVOCOM). During FY 1977, there were continuing problems with AUTOSEVOCOM switches at Heidelberg and Vaihingen. The EFO provided information and assistance to the DPM office and to 5th Signal Command in getting personnel from CONUS to this theatre to aid in resolution of the problem. This was an on-going situation and resolution was expected only after completion of the AUTOSEVOCOM enhancement program in CY 1978.

(U) Northern Communications Brigade 75. The site selected, in the vicinity of Garlstedt, Germany was formerly a firing range devoid of all facilities necessitating complete new construction from the ground up. Site clearing began in August 1976 after the Federal Republic of Germany (FRG) released approximately \$68.5 million for construction of this project. The EFO personnel participated in numerous meetings and conferences; the attendees varied between USAREUR, DCA, 5th Signal Command and the Federal Republic of Germany. The EFO personnel also assisted/coordinated in obtaining USAREUR Force closure dates, FRG construction schedules, tower coordinates for Bremerhaven and Garlstedt locations, TV requirements, and FM radio requirements.

(U) Army Airfield Upgrade - Europe. The EFO activity participated in all phases of the Army Airfield/ Heliport Upgrade project in Europe. EFO personnel monitored the site preparation of the AAF/HP's to be upgraded, called out and coordinated the movement of the BOM's with the 5th Signal Command, 14th ATC, and the appropriate AAF Commander, and also coordinated with USACEEIA-EUR to insure an installation team was alerted in sufficient time to start installation. After start of installation, the EFO monitored the progress and assisted as required to assure successful completion. During September 1975, the manager-ship for the AAF Upgrade Program was transferred from Executive Agency (5th Signal Command) to USACSA. Of the 26 sites in the program, 10 Army airfields/heliports in Europe were in some phase of completion. As of FY 1977, twenty-one AAF/HP's had been upgraded.

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(U) Control of Project Equipment and Bills of Material (BOM's). As a result of the 16/76 Plan, Headquarters, USACC, studies were conducted to ascertain the feasibility of civilianizing the Area Maintenance Supply Facility (AMSF) - Europe operation. Findings culminated in a changeover from military manning to a civilian contractor during the period July through September 1976. On-going technical assistance by the EFO in management improvements to enhance the flow of project equipment and materiel was anticipated in this program of mutual interest.

(U) USACSA Field Office - Korea. The Chief, USACSA Field Office-Korea represented the Commander, USACSA/Project Manager DCS (Army) Communications Systems in Korea. Field Office personnel represented the PM in all facets of project implementation and life cycle support, providing the primary interface to United Nations Command/US Forces Korea/Eighth US Army.

(U) Automated Multi-Media Exchange (AMME) - Korea. Following approval of the AMME for Korea, Field Officer personnel insured accomplishment of the Architectural and Engineering (A&E) design, and ultimate contract award for construction of the AMME building. The installation was to be completed by early second quarter FY 1978. Site preparation for SRT's began in second quarter FY 1978 with installations beginning immediately following AMME IOC. Coordination was required with Army, Navy, Air Force, and joint commands throughout Korea to determine terminal requirements for AMME subscribers.

(U) 38th ADA Upgrade Program. The 38th ADA Upgrade Project, which included a reconfiguration of existing microwave systems, deinstallation of microwave links, and installation of cable to provide a reliable integrated communications system in support of the 38th ADA Brigade was 70 percent complete. The inter and intra-site cable project resulted in the installation of more than 220,000 feet of new multi-pair buried and aerial cable on eleven sites. Existing microwave equipments were deinstalled for rehabilitation.

(U) Changsan-Pulmosan-Chinhae Project. Fiscal year 1977 saw the culmination of much coordination and a supreme logistics effort by this Field Office on the critical C-P-C microwave program. This program was undertaken to upgrade a marginal quality microwave link which provided the Chief of Naval Operations-Korea at Chinhae, access into the worldwide military communications network via Korea Wideband Network at Changsan. Communications assets retrograded from Thailand were rehabilitated in Korea and used to the maximum extent possible in this program.

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(U) Automatic Digital Network (AUTODIN) and Digital Subscriber Terminal Equipment (DSTE) Depot Level Support Teams. The Field Office-Korea assisted in insuring the optimum operation of the Automatic Digital Network, through USACSA-directed Tobyhanna Depot Teams which performed depot-level maintenance (DLM) on a scheduled and emergency basis. DLM support was given to the fixed and transportable DSTE subscribers, in addition to the AUTODIN switch at Taegu, which also received DLM support for the power systems and the message switching and technical control equipment, in addition to the DSTE DLM.

(U) Northern Area Upgrade-Korea. The tree-chopping incident at Panmunjon on 17 August 1976 caused attention to be focused on the unsatisfactory quality of communications that had existed for a long time in the northern area. This same incident also illustrated the need for wideband secure voice to the I Corps Commander at Camp Red Cloud and the 2nd Division Commander at Camp Casey. A quick reaction project was initiated to provide the necessary upgrade. The upgrade included installation of new cable near Panmunjon and Camp Casey, installation of a new microwave system from Camp Casey to Camp Dodge, upgrade of additional microwave terminals, and installation and expansion of associated patch and test facilities. The Korean Field Office gave assistance to this critical project, closely monitoring and at times adding emphasis to energize project actions. With continued Field Office emphasis, initial operational capability was scheduled for May 1978.

(U) USACSA Field Office-Pacific. The Chief, Pacific Field Office (PFO) represented the Commanding General, USACSA/Project Manager DCS (Army) Communications Systems in the Pacific, providing primary interface with the Commander-in-Chief Pacific (CINCPAC), Defense Communications Agency-Pacific area (DCA-PAC), Pacific Air Forces (PACAF), US Pacific Fleet (PACFLT), CINCPAC Support Group, and 6th Signal Command. In this capacity, the Chief, PFO, was responsible for monitoring and coordinating the implementation of the major systems/projects addressed below. The following is a brief summary of PFO actions for FY 1977.

(U) Army Airfield Upgrade-WESTPAC. Through coordination with the activities concerned, the PFO assisted in the completion of the upgrade of an additional eight sites during this fiscal year, bringing the total number of sites upgraded to date under this project to 13. This coordination resulted in the orderly flow of project material from CONUS to the final overseas destination, early resolution of last minute engineering problems, and achievement of three highly successful project status reviews.

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(U) AUTODIN Digital Subscriber Terminal Equipment (DSTE) Cross Reference ADP Listing. During FY 1977, distribution was made of the remaining copies of the AUTODIN DSTE Cross Reference Listing developed by PFO personnel to provide AUTODIN DSTE supply/maintenance personnel with an accurate, quick reference document which lists manufacturers part numbers (PN) to National Stock Numbers (NSN), and Federal Item Identification Number (FIIN) to P/N and end item application.

(U) AUTODIN Digital Subscriber Terminal Equipment (DSTE) Depot Level Maintenance (DLM) Teams. During FY 1977, PFO personnel assisted in the call out, movement, and control of ten DSTE DLM teams from Tobyhanna Army Depot. These teams made a total of 27 scheduled site DLM visits and 15 additional emergency site DLM visits. In response to a request from 6th Signal Command, PFO arranged to increase the DLM site visits in Korea from once a year to twice a year. This resulted in greater operational efficiency of 1st Signal Brigade DSTE's and a reduction in serious maintenance problems encountered by the DLM teams in Korea.

(U) Defense Satellite Communications System (DSCS). During FY 1977, PFO personnel chaired or participated in coordination meetings concerning implementation of the DSCS Upgrade, Phase II, Stage 1C, including an Interim Digital Communications Subsystem (IDCSS) at various sites in the Pacific area. Of particular significance was the extensive multi-service coordination effected by the PFO at the Pacific headquarters level and with CONUS and WESTPAC elements to assist in the successful activation of two AN/FSC-78 earth terminals at Wahiawa, Hawaii, one AN/MS-46 at Clark AFB, Philippine Islands, one AN/MS-46 at Camp Zama, Japan, and IDCSS equipment associated with those terminals and the one at Song So, Korea. PFO took the lead role in coordinating USACEIA installation and testing of the IDCSS at all sites (Army, Navy, and Air Force).

(U) Logistical Support Visits to JUSMAG Philippines. During FY 1977, personnel of PFO provided logistical assistance to the JUSMAG unit in the Philippines to help them to train the Philippine Armed Forces to be able to obtain follow-on logistics support for the Foresight Sierra Project through normal international logistics support channels.

(U) TMDE Procurement. The PFO monitored, coordinated, and assisted in resolving TMDE problems for the Pacific area. This included their assistance in locating lost or misrouted shipments of TMDE. They reviewed 6th Signal Command, 1st Signal Brigade, USACC Japan, and USACC Taiwan TMDE Excess Reports and coordinated with 6th Signal Command for application of excess TMDE to project or unit requirements. The PFO monitored, assisted, and coordinated with the 6th Signal Command

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on TMDE items for projects such as Technical Evaluation Program, Korea Command and Control System, AUTOSEVOCOM, Technical Control Improvement Program, Army Airfield Upgrade, AN/GRC-171, Changsan/Pulmosan/ Chinhae Microwave Upgrade, Operational Readiness Float, and all other CSA managed taskings.

(U) Wideband Secure Voice Via Satellite (WBSVVS) Program. During FY 1977 circuits from Pearl Harbor, Hawaii, to CONUS, Japan, Philippines, and Korea were successfully activated. Since in no case did the same Military Department operate both ends of any of these circuits, considerable inter-service coordination was required.

(U) Support Group - Fort Huachuca. The mission and function of the Support Group, Fort Huachuca Element was to serve upon request all USACSA elements (DPM's directors, and project officers) and other USACSA field offices as an interface on any activity involving Headquarters, 197 USACEIA. To satisfy this requirement, individual Support Group personnel were assigned specific projects to monitor for the purpose of providing all other USACSA offices with a point of contact that could readily participate in associated activities.

(U) By direction of the Commanding General, USACSA, the Support Group assigned a full-time liaison representative to the USACC Worldwide Military Command and Control System (WWMCCS) office for a 90-day period in order to continuously monitor and report the rapid developments occurring in the January, February, and March time frame. This sustained representation significantly enhanced Headquarters, USACSA, ability to timely respond to USACC tasking.

(U) USACSA Liaison Office, Washington DC. As liaison between Headquarters, United States Army Communications Systems Agency (USACSA) and other Government and non-Government agencies in the metropolitan Washington area, this office obtained information to keep USACSA informed of trends, proposed policies and directives, plans, and programs that may have had an effect on agency operations; developed agency response for urgently needed information when time and distance was critical; represented the Commanding General and Headquarters, USACSA, by providing membership or participation on or at designated panels and meetings when representation by a member of the agency was not feasible; and provided information to appropriate staff sections.

(U) USACSA Field Office - CONUS - Fort Ritchie, Maryland. The Chief of the Field Office-CONUS represented the Commanding General, US Army Communications Systems Agency/Project Manager DCS (Army) Communications Systems in CONUS, and functions as an extension to the authority of the Deputy Project Manager and functional directorates. This office was called upon to assume total management control of projects being implemented within the Fort Ritchie area due to geographic location.

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Acquisition of Strategic Communications Systems

(U) During FY 1977, the US Army Communications Systems Agency continued to acquire and install new communications systems worldwide and to expand and modify existing systems.

(U) Alternate National Military Command Center (ANMCC) TV Switching Systems. The requirement for a TV switching system for the ANMCC was received in September 1974. The system required contractor EF&I of a video/audio multiple distribution switcher with 60 inputs and 160 outputs, and ancillary equipment necessary to provide positive control of TV switching functions for the ANMCC.

(U) This system was essentially computer controlled. The system was cut over in September 1976 replacing the former manually controlled system of lesser input/output capacity.

(U) Beginning in FY 1977, additional upgrading of the system was started to accommodate built-in test equipment (BITE) equipment for further enhancement.

(U) Army Airfield/Heliport Program. The Army Airfield/Heliport Program was a worldwide upgrade of the communications and navigational aids at selected Army airfields and heliports. Its basic objective was to improve the quality and performance of C-E equipment and standardize nontactical US Army airfield/heliports worldwide. Program modernization was in progress in CONUS, Europe and the Pacific.

(U) The many projects included erection of new control towers, consoles, instrument landing and navigation systems, approach control radar lighting systems, installation of new aircraft radio equipment and many other projects. Six major projects in Europe, CONUS and the Pacific were scheduled for completion in CY-1977.

(U) Automated Transportable Communications Terminal (COMFAC). USACSA was tasked to procure two transportable terminals for Intelligence and Security Command (INSCOM) with an option for up to four additional systems.

(U) In September 1977, the prime contract was awarded for a unique communications terminal. Each system was to terminate 19 full duplex data circuits which included eight medium speed circuits capable of direct AUTODIN Mode I interface and 16 low speed teletype circuits. The terminal also had to provide the capability of utilizing the low speed circuits in the OPSCOM (Operational Communications) mode and be fully transportable.

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(U) USACSA was responsible for developing the procurement requirements package, the life cycle logistical support, and managing the project through contract award. During project implementation, they were to continue to manage the implementation of training, development of technical manuals, and overall life cycle support for COMFAC terminals when they were delivered to the user, INSCOM.

(U) AUTODIN Enhancement Program (FY 1975 AEP). The overall objective of the AUTODIN Enhancement Program (AEP) was the enhancement of AUTODIN ASC operations by eliminating the possibility of man/machine interface errors and by the addition of greater equipment redundancy and subsystem alarms. The program was to provide the switches the capability of meeting the present DSSCS/DIN requirements and the ability to meet the forecast requirements in the FY 1973-1978 time frame.

(U) One of the tasks (task 2) for the FY 1973 AEP was to completely replace the then existing magnetic drum mass memory subsystems with new state-of-the-art disc mass memory subsystems. Due to fund limitations, only disc subsystems were procured.

(U) In September 1974, DCA provided a requirement to complete the drum mass memory subsystem replacement with disc mass memory subsystems identical to those procured under the FY 1973 AEP. Accordingly, to take advantage of considerable savings that would accrue to the Government by authorizing hardware procurement prior to 30 December 1974, the formalization of a task order under an existing basic ordering agreement was expedited to achieve the pricing advantage.

(U) The FY 1975 AEP required the procurement and replacement of 19 additional disk mass memory subsystems to replace existing drum subsystems which, due to design and support obsolescence, became increasingly more difficult and costly to maintain in the required operational readiness posture. This requirement was fulfilled and replacement was completed in April 1976.

(U) Automated Multi-Media Exchange (AMME)-Level Automated Telecommunications Center (ATCC). The AMME ATCC was an advanced communications system designed to provide improved, comprehensive service at selected communications centers around the world. The system, as a major part of the Army Telecommunications Automation Program (ATCAP), provided faster and more versatile store-and-forward message switching between dispersed remote office terminals and/or AUTODIN. Also, the AMME provided standardized, automated supervision of record communications, accounting, routing and delivery of message traffic, and the capability for electrical interface between local and/or remote data processing installations (DPI's), AUTODIN, and AMME subscriber terminals. AMME provided the maximum degree of uniformity in hardware, software, and procedures consistent with satisfaction of individual communications center requirements. The AMME-level

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ATCC consisted of four basic subsystems--the AMME, the transmission (patch and test) facility, the remote terminals, and a communications line interface (CLI) to the DPI's.

(U) The prime contract, awarded to UNIVAC, provided system design and engineering, plus the computer hardware which was the nucleus of the AMME ATCC's. A quick-reaction project (QRP) was established with Lexington Bluegrass Army Depot to engineer and furnish the patch and test facilities, and another was awarded to Mohawk Data Sciences to provide interim remote subscriber terminals for AMME sites. The interim remote terminals (IRT's) were later to be replaced at selected sites by standard remote terminals (SRT's).

(U) The SRT contract was awarded through GSA to Astronautics Corporation of America (ACA) in August 1975. It was to provide secure remote terminals for many other US Government applications as well as for the AMME. Acceptance testing was completed 8 July 1977 on SRT pre-installation demonstration (PID) models at the Fort Huachuca Software Support Center (SSC). The Headquarters Fort Huachuca contracting office released delivery orders to ACA for sixteen SRT configurations, with initial delivery to the first CONUS site in March 1978.

(U) A total of five AMME ATCC's have been successfully activated since 1974:

The Oakland Army Base (OARB) AMME was activated in October 1974. Initial steps to expand the standard AMME to an AMME-E began with the expansion of memory from 196 kilobits to 262 kilobits in June 1977, and the upgrade of the magnetic tape system operating capabilities. This hardware upgrade at OARB was completed in July 1977. The AMME-E software package was scheduled for installation at OARB in April 1978. Two secure SRT's were to be installed at the OARB ATCC in June 1978. The site supported one on-post remote terminal and nine individual Army National Guard (ARNG) locations in nine states.

Another AMME located in the Software Support Center (SSC) became operational in August 1975. The SSC was the test bed for the development and maintenance of software associated with the AMME, 205 IRT's configurations, two IRT configurations, and cryptographic devices to test software and hardware concepts in-house prior to site integration. The test bed also simulated software problems so that faults occurring in the field could be corrected.

The Redstone Arsenal (RSA) ATCC was activated in August 1975. A total of 15 remote terminals were installed on the reservation, and 10 individual terminals providing ARNG electrical service to 16 states were planned to be completed by June 1978.

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In July 1976, the Letterkenny Army Depot (LEAD) AMME was activated. A major feature of the LEAD AMME system was the communications line interface (CLI) to the US Army Depot Systems Command (DESCOM) data processing installation (DPI). This interface was a "first" for USACC telecommunications systems; it proved that DPI's, processing huge volumes of data traffic, could be successfully interfaced with automated telecommunications center systems. The transfer rate had been certified at 55,000 bits per second (BPS) from the AMME to the DPI. Installation of 18 remote terminals was completed 28 June 1977; of these, seven were installed at LEAD and 11 support ARNG requirements in 12 states. Long-range improvements included a major data transfer rate enhancement to the AMME DPI CLI, with implementation date planned for June 1978.

The Bailey's Crossroads (BXR) AMME was cut to live operation on 1 December 1976. This system had one remote subscriber, an AMME/ARNG DPI interface. An electrical interface between the BXR AMME system and the Worldwide Military Command and Control System (WWMCCS) DPI's at both Headquarters, Military Transportation Management Center (MTMC) and the Army Operations Center (AOC), Pentagon, was scheduled for completion in November 1977.

In November 1976, a traffic engineering study revealed an update of the AMME equipment and associated software would be necessary to meet the Korean AMME system requirements. In support of the required upgrade, an AR 18-1 appendix requesting delegation of procurement authority (DPA) for the necessary equipment and supporting contract services was forwarded through channels. Approval of this request was expected in October 1977. USACEEIA teams conducted SRT site surveys, one for terminal equipment configurations and related software requirements, and one for SRT site preparation construction requirements. These surveys were completed in September 1977. Plans called for activating the Korea AMME system in 1978.

The Heidelberg AMME system providing over-the-counter (OTC) service was planned to become operational in September 1978. The building site preparation contract was awarded in July 1977, with an expected beneficial occupancy date (BOD) in early 1978. A system upgrade to an AMME UNIVAC 90/60 system with MCC-2 front end processors were required for both Heidelberg and Stuttgart AMME systems. In support of this requirement, an AR 18-1 appendix was approved by HQDA and had been forwarded to GSA for a Delegation of Procurement Authority (DPA), with DPA approval expected by October 1977.

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(U) Direction to develop prototype van-mounted SRT's, under the CEMO for the standard AMME Level ATCC project, was received in November 1976. The vans were to be transportable both by ground and air. Tobyhanna Army Depot (TOAD) was selected to engineer and install the prototype van-mounted SRT's. The prototypes were scheduled to be delivered to the 11th Signal Group at Fort Huachuca, Arizona, in September 1978. Upon delivery, operational tests were to be initiated to determine future field applications for the van-mounted SRT's. The tests were to be performed by the 11th Signal Group in coordination with USACEEIA under the guidance of the Deputy Project Manager, TACS.

(U) All AMME patch and test facilities (PIF's) were originally scheduled to be EF&I'd under a QRP by the Lexington Bluegrass Army Depot (LBAD). Upon Phase-out of LBAD, a new QPR was established at the Sacramento Army Depot (SAAD) to assume PTF responsibilities for the AMME sites.

Consolidated Telecommunications Center (CTCC).

(U) The CTCC was to establish a single automated message processing system for the MILSERVICE tenants in the Pentagon and for other designated activities located in the Washington Metropolitan area. This consolidated system was, by OSD direction provided in August 1973, to include the Automated Message Processing System (AMPS) of the Joint Chiefs of Staff. The central computer complex for this system was to be located in the US Army Pentagon Telecommunications Center.

(U) The Army was tasked with the consolidation project in August 1973. An Implementation Plan (IP) was approved by OSD on 12 June 1974 with guidance to provide for greater use of the Central Computer Complex in the processing and storage of "privacy messages." On 31 January 1975, the Army submitted a project change request as a result of OSD guidance provided on 12 June 1974 and capacity limitations of the IBM 360/50 system.

(U) The Deputy Secretary of Defense directed, on 21 October 1975, that there be only two SSC's in the Pentagon and disapproved separate data bases, files, and other dedicated facilities. On 18 November 1975, the Joint Chiefs of Staff recommended that the Army and Navy consolidate in the Army facility and that the Air Force and OJCS/OSD/DIA consolidate in the OJCS facility. In December 1975, DCA was provided automated message organization capability through a remote OCR.

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(U) More actions followed in 1976. In April, a project to electrically interface the Automated Message Processing System (AMPS) of the JCS to the Army Pentagon Automated Communications System (PACS) for retrieval purposes was successfully completed, and in July 1976, the first phase of providing improved service to the Marine Corps was successfully completed. On 23 June 1976, OSD approved a revised implementation plan and provided guidance to eliminate the communications relay processor (front end), alternate tech control and new microwave system. This was followed by a project change request to include an Automatic Reproduction and Collating System (ARCS) which was approved by OSD on 3 December 1976.

(U) In the next year, change 2 to the IP, which incorporated the 23 June 1976 OSD guidance, was approved by OSD. Also an interim capability for Site R to retrieve JCS messages stored in the Army PACS was cutover in March 1977. Further, in June 1977, IBM 360/65 computer based systems replaced the IBM 360/50 systems in the Army PACS. This was to provide the capacity for the first phase of the Pentagon Consolidation. In May and July 1977, work commenced on the site preparation of the Arlington Annex and Army Pentagon Telecommunications Center (PTC), respectively.

(U) The consolidation project was scheduled to be completed in three phases; phase one was to provide the basic capabilities to consolidate the military services; phase two was to provide final system hardware and automate manual operation such as reproduction and collation of messages; and phase three was to provide service to the JCS at the Pentagon and Site R was to complete the planned consolidation effort.

(U) Consolidation was scheduled to be completed in 1980. To accomplish this, there were in process, or awarded, over 15 hardware procurements, ten software and system procurements 214 had already been completed.

Croughton Autodin Switching Center (ASC) to 150 Lines Upgrade (EMR-129) Expansion

(U) The overall objective of this project was to expand the Croughton ASC from an existing 100-line configuration to a 150-line configuration to meet urgent DCS operational requirements. The upgrade added a sixth processor, an additional Line Termination Buffer Unit, 12 low speed modems and 16 KG-13 COMSEC devices and expanded the DC-to-DC converter facility. This upgrade effort allowed the third line termination controller to be used "on-line" with the Line Termination Buffer Unit providing an interface between the third line termination controller and the subscriber. Installation of the remaining upgrade equipments provided the necessary circuits for immediate and projected circuit commitments.

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(U) The above on-site implementation effort was completed by a Tobyhanna Army Depot team in conformance with an Engineering Installation Package prepared by USACEEIA with project acceptance without exception by the site commander, with initial operating capability (IOC) and cutover being accomplished on 21 June 1977.

DCS Microwave Radio

(U) The original tasking for the procurement of microwave radios was received from USACC by USACSA on 16 June 1970. Procurement was to satisfy Army-Navy-Air Force requirements to replace existing radios that did not provide required DCA specification quality circuits; introduce the use of PCM/TDM to the DCS in Europe; and introduce solid-state circuitry to meet Tri-Service requirements.

(U) The solicitation for this contract was competitive and was awarded on 29 December 1972 to Collins based on their being the only responsive company who could meet the DCA specifications. It was a fixed-price, three-year requirements contract with two one-year option periods (option was exercised by the Government). This DCS microwave radio was a line-of-sight, space or frequency diversity, FM radio with a capability of variable loading up to 600-voice frequency channels. The radio had either a one or five-watt output and it operated in the four or eight GHz frequency range. Input power options provided for operating from either -48 VDC or 110/220 VAC.

(U) Since its inception, the scope of the DCS microwave radio contract was broadened to include modification of the analog radios to a three-level partial response capability. These radios were procured for the Frankfurt-Koenigstuhl-Vaihingen (FKV) and the Digital European Backbone (DEB) Stage I programs.

(U) The purpose of these programs was to (1) provide an alternate wideband path for DSCS traffic to enhance its survivability through the utilization of DCS microwave digital radios; (2) Provide a digital wideband interconnect capability for the DSCS earth terminals to be located in Germany and Italy when the DCS matured and became digital itself. Permitted secure digital extension of DSCS service to user locations; (3) Provide further interconnection of the DCS and NATO transmission facilities, existing as well as planned, at designated locations; and (4) Replace and improve services currently being provided over those line-of-sight (LOS) radio/tropo systems affected by this project which now perform below DCS standards.

(U) The DCS microwave analog radio selected to be modified for the FKV program was the AN/FRC-159, a one-watt space diversity 8 GHz radio. When modified for digital application, it became the AN/FRC-162.

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(U) In order to satisfy the needs of the DEB Stage I Program, it became necessary to modify two analog radios, the AN/FRC-159 and the AN/FRC-160 (5-watt space diversity 8 GHz radio). The AN/FRC-160 was modified for digital application to become the AN/FRC-165 because of the distances involved between the sites in the DEB Stage I program.

(U) In FY 1977, there was a requirement for the US Army in Tehran, Iran, to modify the AN/FRC-155, a 1-watt frequency diversity, 4 GHz analog radio to a three-level partial response capability. This action was to allow interface for digital application in accordance with DCA/DCS standards.

(U) From FY 1973 to FY 1977, the Government procured a total of 176 radios and associated TMDE, T&TE, parts, and manuals. Of the 176 radios procured, 88 were analog (AN/FRC-155 through AN/FRC-160) and 88 were analog radios modified for three-level partial response (AN/FRC-155/162/165).

(U) The original purpose for the procurement of the three-level response radios (AN/FRC-162) was to upgrade the Frankfurt-Koenigstuhl-Vaihingen (FKV) system. Since then, ten AN/FRC-162 and 22 AN/FRC-165 three-level response radios were procured for the DEB I links.

Defense Satellite Communications System (DSCS)

(U) The Defense Satellite Communications Program (DSCP) started Phase II in November 1971 with the launch of two equatorial orbited satellites to provide an uninterrupted and modern communications system. Defense Satellite Communications System (DSCS) Phase II Stage 1B was implemented to upgrade each Army DSCS Earth Terminal (ET) to provide nodal communications capability. DSCS Phase II Stage 1C was started in 1974 by DCA to replace the analog DSCS Phase II 1B system with a digital communications system. It also introduced the heavy terminal AN/FSC-78, the medium terminal AN/MSC-61, which was a replacement for existing AN/MSC-46 and AN/TSC-54 ET, and the light terminal AN/TSC-86 (LT-2) into the tri-service inventory.

(U) The DSCS Phase II Stage 1C comprised space and earth segments which provided satellite nodal and non-nodal secure and anti-jam communications links for voice, teletype and telemetry through the use of digital communications and spread spectrum techniques. The DSCS earth segment consisted of the earth terminal (ET), digital communications subsystem (DCSS), interconnect facility (ICF) and power subsystems, both motor-generators and uninterrupted power sources (UPS).

(U) Major tasks involved in USACSA's project manager responsibility for implementation of DSCS Phase II Stage 1C were to promulgate the Tri-Service Implementation and Installation Plan (IIP) with annexes on integrated logistics support and test and evaluation; monitor site

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implementation tasks via PERT site annexes for each MILDEP; acquire the pulse code modulation multiplexer for the DCSS, digital microwave radio for the ICF, and power sources, environmental control, and related shelters/vans/radomes for Army sites; perform site surveys and EMC analysis; install and test the DCSS for each MILDEP; engineer, furnish, install and test interim DCSS for Army sites; engineer, furnish, install and test the ICF for Army sites; serve as test director of system tests at all MILDEP sites; redeploy existing AN/MS-46 and AN/TSC-54 ET's from specified MILDEP sites to Army sites; monitor Army funds allotted to program; and implement site preparation and building construction at Army sites.

(U) The Director, DCA, was the DOD Program Manager in accordance with DOD Directive 5000.1. DA was assigned responsibility for procurement of earth terminal satellite systems, system peculiar multiplex, user interface equipment, and equipment for establishing and maintaining circuits and links between users for the control subsystem. Each MILDEP was responsible for satisfying requirements for ICF and power upgrading at their assigned earth terminal site.

(U) During FY 1977, the Internal Digital Communication Subsystem (IDCSS) installations in support of wideband secure voice via satellite and special user requirements reached Initial Operational Capability (IOC) at the following locations during May and June 1977: Clark AFB, Hawaii, Landstuhl, Fort Detrick, Menwith Hill, Camp Roberts, DSCS Washington, Camp Zama and Song-So.

(U) Also the AN/MS-46 earth terminal redeployed from Hawaii was installed at Panama on 31 March 1977 to establish USSOUTHCOM satellite communication capability.

(U) The first regular DCSS installation was installed and accepted for new equipment training (NET) at Sunnyvale on 29 July 1977; the DCSS for DSCS Washington (EPAC) was installed and accepted for NET on 30 August 1977; and the Fort Gordon DCSS training configuration installation was in process.

(U) Other accomplishments included the following: a DSCS Standard Parametric Amplifier was installed in the AN/FSC-9 earth terminal at Camp Roberts; final design drawings on AN/MS-61 Coltano building design had been approved; authorization to advertise for bids for building construction had been granted; design efforts continued on the Berlin AN/MS-61 building design; construction on the Landstuhl AN/FSC-78 terminal building continues; and a contract was awarded by MERADCOM on 13 September 1976 to procure seventeen standard-family 500 kw auxiliary generators; initial deliveries were to commence in December 1977.

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Digital Radio and Multiplexer Acquisition (DRAMA)

(U) This program provided for the acquisition of common digital multiplexers and radios for use by the Army, Navy and Air Force in the DCS and non-DCS programs.

(U) Interim tasking for this program was received by message September 1974 from US Army Communications Command (ACC). The final Management Engineering Plan was issued by the Defense Communications Agency on 28 May 1975. Also the Project Manager was tasked in July 1975 with the responsibility to acquire and furnish to the respective DCS subsystem E&I managers, new digital microwave radios and first and second level multiplexers for DCS SIP 1-74 and 1-75 and other projects.

(U) Three equipment specifications were coordinated with industry. The first level multiplexer TD-1192()/F specification was published on 20 August 1975 with Amendment No. 4 dated 15 April 1976; and the second level multiplexer TD-1193()/F specification was published 1 March 1976 with Amendment No. 2 dated 16 July 1976, and the radio AN/FRC-()() was published 1 March 1976 with Amendment No. 2 dated 16 July 1976.

(U) TD-1192, now nomenclatured the AN/FCC-98(V), was issued on 3 December 1975 and a multi-year requirements contract was awarded on 24 June 1976 to the single responding offeror, TRW Incorporated. This contract was separated from other DRAMA equipment procurements due to the more immediate need of the Defense Satellite Communications Systems. Solicitation for the second level multiplexer TD-1193()/F and the radio AN/FCC-()() was issued on 29 April 1976. On 9 June 1976, this solicitation was suspended by Amendment No. 2 pending revision of the solicitation and specifications. This was accomplished in Amendment No. 3 which was issued on 27 August 1976. The change permitted more commercial features to be utilized and deleted requirements for the Government testing of models. Four offerors responded to the competitive solicitation. A three-year requirements contract was awarded to TRW Incorporated, on 29 April 1977, as the lowest price acceptable offeror. Two option periods for the extension of the contract in two-year increments were priced and contained in this contract. Consequently, an Economic Price Adjustment (EPA) clause was included.

(U) All equipment specifications for DRAMA required the use of built-in test equipment and used a three-level maintenance and support concept, i.e., on-site, off-site and depot. Initial equipment production deliveries for the AN/FCC-98 were to start February 1978 and in August 1979 for the TD-1193 and the AN/FRC-()() digital radio.

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Digital Transmission Evaluation Project (DTEP)

(U) The DTEP was conducted at an Army Digital Test Facility at the US Army Electronic Proving Ground (USAEPG), Fort Huachuca, Arizona. It was under project management of USACSA, test and engineering direction of USACEEIA, with testing performance charged to USAEPG. The purpose of this project was to evaluate commercially developed digital communication systems/equipments and government developed encryption equipments for determining their suitability/applicability in support of DCS digital communication equipment needs and communication program requirements.

(U) Digital equipment was evaluated in a back-to-back configuration followed by link testing. The four links available for use are a 32-mile link from Fort Huachuca to Site Sybil, an 82-mile link from Mt. Lemmon to Mule Mountain, a 24-mile link from Mule Mountain to Fort Huachuca and a 48-mile link from Site Sybil to Mt. Lemmon; in addition, the four links would be interconnected for total system operation. Test data gathered were compared with recorded data obtained during link testing to determine effects of propagation path influences. The data resulting from these evaluations were used for the development of digital transmission equipment performance standards, system procurement, technical specifications, system test methodology and system engineering criteria. Moreover, these data served to effectively guide standardization and procurement of future digital equipments for use in the Defense Communications System.

Emergency Action Voice Switching System (EAC) AN/GTC-29(V)-Relocations

(U) The purpose of this project was to increase the communications capabilities of Fort Hood, Texas, and Fort Bragg, North Carolina, by the acquisition and transfer of the Emergency Action Switching Systems at Fort Monmouth, New Jersey, and at Fort Shafter, Hawaii.

(U) The Emergency Action Voice Switching System, a 100-line telephone switching system, was contractor deinstalled in February 1977, at Fort Shafter, Hawaii and reinstalled at Fort Bragg, North Carolina.

(U) The Emergency Action Voice Switching System located at Fort Monmouth, New Jersey, Signal School was deinstalled by a CEEIA team and was being reinstalled at Fort Hood, Texas. Initial Operational Capability (IOC) was scheduled for November 1977.

European Telephone System (ETS) Upgrade

(U) Overall objective of this project was the replacement, over a six-year period, on an engineer, furnish, and install (EF&I) basis, of approximately 110 Dial Central Offices and 5 Tandem Switches (outdated electro-mechanical, of foreign manufacture) with state-of-the-art electronic equipment, and to replace Dial Service Assistance cord boards with modern cordless consoles. Most locations were in Germany.

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(U) A key element in this project was that all equipments had to be tested and certified to the criteria of the Deutsche Bundespost (DBP). The DBP was to prepare a regulation in this regard. USCINCEUR designated USAREUR as representative for the US Forces in Europe for negotiating the agreement with the DBP; 5th Signal Command was the spokesman.

(U) Correspondence from the Federal Republic of Germany (FRG) Minister of Defense to our Secretary of Defense, in January 1977, indicated a desire that we give consideration to satisfying the ETS requirements through the Deutsche Bundespost. Based on subsequent Secretary of Defense direction, issuance of the solicitation was placed in a hold status pending a US Government study and negotiation with the FRG.

(U) In June 1977, the House Appropriations Committee (HAC) recommended deletion of \$9.8 million (FY 1978) from European Base Communications. The HAC further recommended that if replacement was eventually required, consideration should be given to leasing service from Deutsches Bundespost (DBP) rather than purchasing equipment. This recommendation resulted in total FY 1977 OPA funds being decommitted and the program withdrawn at the direction of DA; total FY 1977 O&MA funds were returned to Headquarters, USACC, and the FY 1978 OPA program for DCO replacement will be withdrawn.

(U) During August 1977, a meeting, hosted by the 5th Signal Command, convened for the purpose of developing a package to describe requirements for a leased ETS. A package was developed to describe the required technical performance, reviewed by the ECOM Legal Department and subsequently provided to the DBP at a meeting held in Bonn, Germany, September 1977.

(U) In FY 1978, an anticipated receipt of DBP cost estimate is expected for leased requirements and cost comparison (leased-vs-buy) studies will be continued.

EWCS Link Improvement - Germany

(U) This project was a compilation of various related C-E tasks not addressed in other near-term transmission projects. Link improvements including link activations and deactivations which were to be accomplished under this project are identified below.

(U) Frankfurt-Darmstadt Temporary Reroute Via Feldberg (Beat-the-Bank). The existing FKT-DST LOS M/W link (MO 558) was placed in jeopardy due to the construction of a high-rise building in the Frankfurt area. To preclude the potential loss of the MO 558 link traffic due to signal degradation or complete signal loss, an interim solution was

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to temporarily install an alternate microwave link between Feldberg and Darmstadt using AN/FRC-80(V3) radios; and, if necessary, reroute the FKT-DST traffic via the DCS site at Feldberg. Installation of the alternate microwave link was completed during February 1976 and was ready to pass traffic should the need arise. The 5th Signal Command assumed Operation and Maintenance (O&M) responsibility in November 1976.

(U) Heidelberg-Donnersberg GHz Upgrade. Purpose of this link improvement was to replace the existing AN/GRC-66 radios with 8 GHz AN/FRC-80 microwave radios on the HDG-DON link (MO 305). Radio installation was held in abeyance pending completion of tower modification which was expected to be completed by 30 November 1977.

(U) Schwetzingen Drop and Insert. This task was a follow-on to, but not part of, the FKV project where the existing microwave links from Schwetzingen to Heidelberg and Koenigstuhl were upgraded by the installation of Radio Set AN/FRC-162. Circuits at Schwetzingen were routed back-to-back between the AN/FRC-162 equipment at baseband frequency. This improvement consisted of installing PCM/TDM multiplex equipment TSEC/CY-104 and AN/FCC-97 at Schwetzingen to permit a 24-channel drop and insert capability to be added in both directions. Cutover was accomplished on 11 January 1977.

(U) Frankfurt-Koenigstuhl/Frankfurt-Darmstadt Digital Upgrade. This link improvement consisted of deactivating and rerouting via Breitsol-Melibokus the Frankfurt-Koenigstuhl tropospheric scatter link (DO 303) to provide higher quality circuits between Frankfurt-Koenigstuhl and to interface with the FKV project digital upgrade links at Koenigstuhl. Also, this task was to provide for an improved reroute of the existing Frankfurt-Darmstadt link (MO 588) and provide for future upgrading of the existing Koenigstuhl-Worms link (MO 276) with expanded capacity. All major item BOM's were on procurement. Detailed engineering and installation plans were received from USACEEIA and all installation material was being acquired. IOC projected 31 August 1978 pending completion of tower rehabilitation work at Frankfurt, Freitsol and Darmstadt; and new tower and C-E facility construction at Melibokus.

(U) Bocksberg-Breitsol Reroute. This task was part of the overall program to upgrade/modernize the existing Berlin-Bocksberg-Breitsol Tropo System by replacement of the Bocksberg-Breitsol portion of the Berlin Tropo System (link TO 606) with a new interim analog LOS microwave link between Bocksberg and Koterberg; and the extending circuits on through Rothwestern, Schwardenborn and Feldberg to Breitsol and Frankfurt. All major items and installation material were being acquired. Detailed engineering and installation plans were received from USACEEIA. Projected 31 May 1978 IOC date was pending completion of tower rehabilitation work at both Bocksberg and Koterberg.

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(U) Koenigstuhl-Worms 8 GHz Upgrade. This task included upgrading the existing KSL-WMS microwave link (MO 276) (which used Seimens radio and multiplex equipment) by installing a new 8 GHz space diversity microwave link using AN/FRC-80 radio and AN/FCC-18 multiplex equipment. This task had been amended to require installation of new digital links via Mannheim (Funnari Barracks) vice analog radio upgrade of existing link. Detailed implementation schedule to be developed by 30 December 1977. Construction of new M/W tower in Worms and Mannheim would be pacing factors.

(U) Site 300 Consolidation. This effort consists of relocating DCS microwave transmission facility at Gablingen, Germany, to Site 300. A new tower was to be installed. In addition, the existing USACC-operated technical control facility located in the "Chapel Building" would be relocated and consolidated with the USASA technical control facility at Site 300. This relocation/consolidation of C-E facilities would eliminate the current circuit noise problem due to poor cable quality between the two locations, relieve several equipment bays, including a large uninterruptible power source (UPS), and reduce site personnel requirements. Installation and system test were completed; the 5th Signal Command was to assume operation and maintenance (O&M) responsibility in November 1977.

(U) NORCOM FDM Multiplex Overbuilding. This project was a transmission overbuild of existing communications circuits between Bremerhaven, Linderhoff, Feldberg, and Frankfurt to accommodate requirements for Brigade 75 and the rerouting of the Berlin-Breitsol tropo circuits.

(U) System engineering was complete. All BOM items were on acquisition, but due to long procurement lead time for multiplexer terminal AN/FCC-18 assets, they would not be available to complete an IOC of 31 October 1977. To satisfy an Air Force (AF) near-term circuit requirement (AF Creek Program) this office was installing an interim 24-channel expansion with available assets on hand. IOC for the interim expansion was 7 October 1977. AF and DCA concurred with this approach. IOC for the overall multiplex overbuild was rescheduled to 30 April 1978.

(U) Chievres-Flobecq/Shape-Lechenoi Line-of-Site (LOS) Links. This new task to be implemented in FY 1978 consisted of installation of new 60-channel analog M/W LOS radio link (LC-4) between Chievres and Flobecq. In addition, a new M/W LOS link was to be established between Lechenoi and SHAPE vice Flobecq-SHAPE. At Chievres, a patch and test facility and multiplexer UCC-4 was to be installed, a new tower to be erected, and the existing multiplex at Hillington was to be reconfigured.

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Foresight Sierra Communications System Expansion Project (FSCS)

(U) The Foresight Sierra Expansion was a MAP-funded project to add two tropospheric links to the existing system (which included one tropo link and two microwave links). Originally FSCS was completed in 1971 by Philco-Ford (P-F). The expansion was accomplished by in-house engineering and by joint USA-AFP (Armed Forces Philippines) military personnel using surplus Southeast Asia (SEA) assets and reprogrammed JUSMAG funds. This system included two 60-channel tropo links; training facility (Fort Bonifacio), two position toll telephone switchboards and a 200-line telephone dial exchange.

(U) The total Foresight Sierra project involved work by the contractor (Philco), US and AFP personnel. In association with the FSCS, two dial central offices and one two-position toll test board were procured from Stromberg-Carlson by CSA for the AFP and were installed in the FSCS system by AFP personnel. A CEEIA Field Office located near Manila monitored the project until March 1975, at which time the office was closed. The FSCS expansion project was completed, tested, and formally turned over to the AFP on 14 March 1975.

(U) After turnover, a larger than anticipated volume of message traffic was handled by the Tagaytay-Mount Luay link. Expansion of this link from 60 to 120 voice channels was requested by the AFP. On 22 July 1975, USACSA was tasked for this expansion. The required procurement actions had been initiated and shipments of equipment were scheduled to be completed by December 1977. AFP personnel was to install the new equipment with US Army personnel providing technical assistance as required.

Indonesian Communications Systems (INDOCOM)

(U) Indonesian Communications System (INDOCOM) was a five-year (FY 1971-1975) MAP/AID program to provide communications for the Indonesian Armed Forces. The numerous subsystems that comprised the total system was to utilize UHF, VHF, and HF microwave equipments. The system was installed under the modular concept, i.e. it consisted of networks, each, in itself, an operating communications network available for use until the total system was completed. A total of eleven Army, Navy, Air Force and police communications networks were originally planned.

(U) The planning for each NET was accomplished by the Indonesians and the US Defense Logistics Group (USDLG) in Indonesia and contained in the five-year plan published by the USDLG. Installation of the equipment was being accomplished by Indonesian personnel, under the supervision of a US Army warrant officer.

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(U) Since the inception of the INDOCOM Project in 1971, the Hankam-Kowilhan, Kowilhan Command, Mabad-Kodam (Army), Bandung-Surabaya Garrison, Mabad-Daeral (Navy), Daeral-Sional (Navy), Kodau-Airbase Radio, KOOPS (Air Force) Command, Mabak-Komdak Police, and the Kodam-Korem-Kodim Phase I (Army) network bills of material (BOM's) had been received and installed in Jakarta and become operational during FY 1973-1976. No assistance had been provided for the Mabak-Komdak Police Net since August 1974.

(U) Project INDOCOM presently consisted of thirty-seven sub-projects independently managed by the United States Army, Air Force and Navy. From the total of 37, four sub-projects fell under the project management responsibility of the United States Army Communications Systems Agency for implementation and installation. The four sub-projects are:

- a. Kodam, Koreim, Kodim (KKK) Radio Net
- b. General Support Maintenance Facilities Procurement
- c. Direct Support Maintenance Facilities Procurement
- d. Radio/Cable Switching Integration System

(U) All major BOM items for the KKK radio net were delivered. The General and Direct Support Facilities procurement were scheduled for completion in November 1977. Procurements for the Radio/Cable Switching Integration System were to begin in October 1977.

Northern Area Upgrade-Korea

(U) Existing communications to Camp Dodge, which furnished service to the Joint Security Agency (JSA) at Panmunjom, was comprised of a marginal quality tactical grade system which originated in Camp Howze and was relayed through site Lexington to Camp Dodge. The tree-chopping incident near Panmunjom illustrated to all concerned the unsatisfactory type and quality of existing communications and emphasized the requirements for upgrading that system.

(U) In addition, and also resulting from the tree-chopping incident, the need for a wideband secure voice capability to Camp Red Cloud and Camp Casey required an expansion of the existing Korean Wideband Network (KWN) between Youngsan, Camp Red Cloud and Camp Casey.

(U) This project was to provide the transmission system to meet the requirements for rerouting and upgrading the communication system to Camp Dodge, and upgrading the existing KWN system to meet the wideband secure voice requirement. Also this project consisted of a new

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microwave system, utilizing AN/FRC-109 or AN/FRC-164 radios, and AN/FCC-55 multiplex, between Camp Dodge and Camp Casey via Papyongsan, and via a passive reflector on Hill 218, plus an additional supergroup on the existing system from Yongsan to Camp Casey, through Namsan, and Camp Red Cloud. The Project Manager was tasked on 28 Marcy 1977 to engineer, furnish and install the system with completion forecast for April 1978. The upgrade consisted of providing patch/test facilities, DC battery plants, power, towers, antennas, waveguides, shelter expansions, and site preparations as required. Further, it meant installing 17,000 feet of 50 pair, 22 AWG filled cable from the Joint Security Agency (JSA) compound to Panmunjom and 9,000 feet of 600 pair, 22 AWG pressurized cable between Camp Casey Dial Central Office and Camp Casey microwave.

Saudi Arabian Army Delta Net Rehabilitation

(U) The present 10-year old Delta Net radio was the primary command and control communications system of the Saudi Arabian Army. Under direct contract with the Saudi Arabian Government, Collins Radio installed the original high frequency radio system.

(U) This system gradually deteriorated over the years; sites became inoperative. A joint DOD survey of the Saudi Arabian Armed Forces was conducted in 1974. USACC, USACSA, and USACEEIA members participated in the Army portion of the survey and prepared a comprehensive report and recommendations to improve the Saudi Arabian Army communications, logistics and training. The deteriorated condition of the Delta Net, due to humidity and the lack of adequate personnel and maintenance, was documented during this survey. On 11 January 1975, the Chief, United States Military Training Mission (CUSMTM) requested CINCEUR to prepare a Letter of Agreement (LOA) for the Saudi Arabian Government to finance a US survey team to determine the requirements for the repair of the Delta Net, develop a bill of materials, a statement of work (SOW), personnel requirements, logistics, training, and a procurement package for a USG contract that could be awarded to a civilian contractor for the actual repair work and other related facets.

(U) In August 1976, the Delta Net survey by USACEEIA/USACSA/Collins was completed, and the statement of work, bill of materials, training, logistics and personnel requirements were completed by the Collins Radio Group in March 1977. USACSA then forwarded these documents to USACC with a USACSA-prepared Letter of Offer in March 1977. USACC indorsed the documents and LOA, and forwarded them to DARCOM for further action.

(U) The remaining portion of this task was the US Government briefing to the Saudi Arabian Government and the United States Military Training Mission (USMTM) on the statement of work and the Letter of Offer. This portion of the task was expected to be completed in January 1978, and result in new tasking to implement the rehabilitation of the Delta Net Radio System should the Saudi Arabian Government accept the LOA and SOW.

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Technical Control Improvement Program (TCIP)

(U) The Technical Control Improvement Program (TCIP) was a continuous program (FY 1971-1981) designed to improve, expand, and update the Defense Communications System (DCS) to facilitate the maximum utilization of the available communications resources, increase reliability, and achieve maximum performance of the DCS. Sixty-eight project sites were being upgraded under the TCIP, of which ten sites were completed between 1 October 1976 and 30 September 1977. Technical Control facilities (TCF) upgrade were completed during FY 1977 at Camp Roberts, Howard Air Force Base, Bremerhaven, Koenigstuhl, Gablingen, Changsan-Pulmosan-Chinhae, Bucket, and K-16 Korea. Thirty-six sites were scheduled to be completed by 1 October 1978. Total funds appropriated to date for these sites were \$30.2 million.

(U) Tasking was received for the Voice Orderwire Program in June 1977. This tasking entailed upgrades or new installations at 139 sites throughout the world. Also, during FY 1977, 39 TCF site packages were developed and forwarded to USACC and DCA for review and possible future FY 1978 upgrades.

(U) This agency was tasked with Army's portion of the Automated Technical Controls (ATEC). When deployed, this program will provide the capability of computer-assisted performance assessment, fault isolation and reporting.

Territorial Command Network (TCN)-Spain

(U) The Territorial Command Network (TCN)-Spain was a joint-funded MAP program to provide the Spanish Army and Navy with a communications system to interconnect the Spanish High General Staff in Madrid with 15 Army and Navy Captain General Headquarters and bases located throughout Spain.

(U) This network was to be utilized for command and command-related traffic. During periods of national emergency, the TCN will be fundamental to the rapid development and quick response of the Spanish Army and Navy. In normal times, the NET was to serve routine administrative and logistics functions, as well as command communications.

(U) On April 15, 1974, a fixed price incentive contract was awarded to Federal Electric Company (FEC), a division of International Telephone and Telegraph Company (ITT) to engineer, furnish, and install this system. The system was composed of 42 radio links and one cable link between 42 military locations; three telephone tandem switching offices (200 lines); 19 telephone PABX's (100 to 400 line); 15 cordless switchboards (25 line); 32 new technical control facilities; two teletype message switching centers; and 52 new diesel generators.

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(U) All phases of the project continued to advance in 1977. The contractor delivered the majority of the project equipment, including tools, test equipment, and spare parts. Contractor training was completed except for the remainder of on-the-job training. Subsystem A was conditionally accepted on 4 April 1977. Test and acceptance of Subsystem B was substantially complete except for software problems on the message switches at Site 1, Alto Rey, and Site 5, Espuna. Subsystem C installation was almost complete with preliminary testing being conducted on some sites by the contractor. The current IOC for total system completion is December 1977.

USA-USSR Satellite Direct Communications Link (DCL)

(U) As a result of negotiations at the diplomatic level with the USSR, an agreement was signed on 30 September 1971 in which it was agreed to upgrade the existing Direct Communications Link between Washington and Moscow (MOLINK) from the present radio and cable system to a more modern satellite communications system. The DCL was to provide direct teletype communications from subscriber terminals in the vicinity of Washington, DC to subscriber terminals in the vicinity of Moscow. This was to be accomplished through two independent satellite systems and their respective terrestrial interconnect facilities. The two satellite systems to be utilized were the Russian Molniya III and the USA commercial COMSAT INTELSAT IV.

(U) The latter system was activated and end-to-end testing was successfully completed with the USSR on 24 December 1974. That same month, the USSR notified the USA that they would employ Molniya III instead of II. The Molniya III system began end-to-end testing on 2 December 1975; testing on this system was under the control and management of the USSR. Both systems were undergoing daily testing.

Washington Area Secure High Speed Facsimile System (WASHFAX III)

(U) The WASHFAX III is a major project in the Washington DC area providing a secure high-speed, high-resolution facsimile system. It consists of contractor-leased equipment, government-provided COMSEC equipments, and 1.544 megabits per second (Mb/s) circuits. This facsimile communications system was provided to elements of the executive branch of the federal government, both civil and military.

(U) Nineteen facsimile terminals were to be located at 11 sites. One of the terminals was an off-line spare, and the remaining terminals were interconnected via a switch to be located in the Pentagon.

(U) A contract to furnish and install the facsimile terminals and switch was awarded in December 1975. DECCO awarded the contract for lease of the 1.544 Mb/s circuits during March 1976. Installations of the government-provided COMSEC equipment was initiated and the contractor conducted tests on the pre-production model of the WASHFAX

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terminal during August and September 1976. Acceptance tests of the terminals began in July 1977 and system IOC was to have been achieved in October 1977.

Chemical Demilitarization and Installation Restoration

Background

(U) A Program Manager for Demilitarization of Chemical Materiel was established 11 October 1972 in order to provide intensive management for the accomplishment of the chemical demilitarization program.

(U) Extensive demilitarization planning and actual operations had been underway since the early Seventies and the resulting public and political interest prompted the Army to take a closer look at possible onsite chemical, biological, and radiological (CBR) contamination that may have resulted from research, testing, and manufacturing operations during the past 30 or more years.

(U) Historically, the Army had dealt with contamination only as specific problems surfaced. However, several factors caused the Army to direct comprehensive efforts to contamination problems in general. These factors include: (1) the increasing public and national interest in the environment; (2) the progressive encroachment of civilian communities to the borders of previously isolated Army installations; (3) the clear tendency of the Army to consolidate its real estate and release land for public use; and (4) the growing concern that known contaminants could be migrating steadily to installation borders and pose a potential environmental or health hazard to now adjacent communities.

(U) The Army realized that a program to restore these installations to a point where they would be suitable for public use would be a technically complex and costly undertaking. Also, the technology base was shallow and in many areas, the state-of-the-art would have to be advanced.

(U) In recognition of the technical complexity, high cost, political visibility, and involvement of a wide range of Federal agencies, the Assistant Secretary of the Army for Installations and Logistics directed in March 1975 that the installation restoration effort be placed under project management control.⁸ The mission of providing intensive centralized management for the installation restoration effort was combined with that of the existing Office of the Program Manager for Demilitarization 245 and Installation Restoration (PM CDIR).⁹ The Secretary of the Army approved the new Project Manager's charter on 22 August 1975.

⁸ Memo for the Dir of Army Staff, ASA(I&L), HQDA, 11 Mar 75, subj: Rocky Mountain Arsenal Clean-up.

⁹ Ltr, DAMO-ODC, HQDA, 3 Apr 75, subj: PM, Chemical Demilitarization and Installation Restoration.

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(U) During 4th Quarter FY 1976 (July) the Department of Defense assigned tri-service responsibility for installation restoration technology to the Army.¹⁰ The Project Manager was given this added task in FY 1977T and was also assigned responsibility for the demilitarization of military incapacitating agents and munitions.¹¹ A revised Project Manager charter, reflecting these additional responsibilities, was approved on 29 April 1977 by the Secretary of the Army.

(U) As the chemical demilitarization and installation restoration projects grew in magnitude and complexity, there was an increasing need for a formalized mechanism to systematically plan, execute, and manage the technical and resource aspects associated with missions of the office. Accordingly, in early FY 1977, efforts were directed to devise and develop a comprehensive management system that would effectively integrate technical program requirements and performance with resource requirements and utilization. In August 1977 the system concepts, policies, and procedures were promulgated in CDIR Regulation 5-1, 25 August 1977. The major components of the system include planning, programming and budgeting, funding, reporting, and evaluation aspects for both the chemical demilitarization and installation restoration program. The provisions of the Integrated Technical and Resource Management System (ITARMS) were officially implemented, effective FY 1978, and formed the basis for comprehensive planning and documentation of program objectives in coordination with field activities (performers) and provided an incisive and effective means of performance measurement for assigned mission projects. The ITARMS concept was submitted as a nominee for the Annual DA Financial Management Improvement Award.

Mission and Responsibilities

(U) The Project Manager for Chemical Demilitarization and Installation Restoration provided intensive centralized management for the timely and effective accomplishment of the lethal chemical demilitarization and installation restoration programs. Within DA, he was responsible for and exercised authority over the planning, direction, and control of the following: Demilitarization of hazardous chemical substances and munitions, including lethal, incapacitating, and other chemicals which were designated for disposal. The effort included design, development, and acquisition of special equipment and facilities. Identification and containment and/or elimination of CBR contamination on Army properties, with emphasis on areas where contaminants were found to be

¹⁰ Memo for Sec of Mil Departments, Dir of Defense Research & Engineering, 23 Jul 76, subj: Installation Restoration Programs.

¹¹ Ltr, DAMO-ODS, HQDA, 16 Aug 76, subj: Chem Demil and Installation Restoration.

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migrating off Army properties in hazardous amounts and pose an immediate threat to the public health and welfare of the surrounding community, or when properties had been identified for release or other use.

(U) All operational aspects of chemical demilitarization and installation restoration programs and the post-operational validation that project objectives had been achieved.

(U) In addition, the Project Manager for Chemical Demilitarization and Installation Restoration was assigned the responsibility within DOD as the lead service for development of technology and standards for all DOD restoration programs involving CBR contaminants.

Staffing and Organization

(U) On 10 June 1976, Colonel Frank A. Jones, Jr., was appointed Project Manager for Chemical Demilitarization and Installation Restoration. Mr. Charles Baronian served as the Acting Deputy Project Manager. The Project Manager reported directly to the Commanding General, US Army Materiel Development and Readiness Command.

(U) Within the Office of the Project Manager, there were two major mission elements, an Assistant Project Manager for Chemical Demilitarization (LTC F. M. Durel, Acting), and an Assistant Project Manager for Installation Restoration (COL D. D. Wingfield). A Technical Support Office (LTC Robert Hanson, Acting Chief) served to support both assistant project managers as did the Program Management Office (Mr. H. Robert Feinberg, Chief). An Administrative Officer (Mr. Richard Jackson, Chief) is also assigned within the Office of the Project Manager.

(U) TDA, M1-W3V8AA, dated 1 March 1977, authorized 20 military and 85 civilian spaces. During FY 1977, the Project Manager had 18 military officers and 71 DAC's onboard, with 16 spaces vacant. Recruitment action was underway to fill these spaces. Assigned personnel covered the spectrum of chemical, biological, and radiological disciplines.

Chemical Demilitarization

(U) Ongoing programs at the onset of FY 1977 included the acquisition and testing of the Chemical Agent Munitions Disposal System (CAMDS) at Tooele Army Depot (TEAD), Utah; two phases of Expanded Project EAGLE at Rocky Mountain Arsenal (RMA), Colorado; the four phase plan for the disposal of chemical items and test residue at Dugway Proving Ground (DPG), Utah; the disposal of chemical identification and training (ID) sets; staffing of a concept plan for delimiting the incapacitating agent BZ and associated munitions at Pine Bluff Arsenal (PBA), Arkansas; and the procurement of Real Time Monitors and testing of the Demil Protective Ensemble by Chemical Systems Laboratory (CSL), Aberdeen Proving Ground, Maryland.

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(U) Chart 22 is a listing of the completed chemical demilitarization projects, and at chart 23 is a summary listing of current demilitarization tasks and their status.

Program Budget Status

(U) The FY 1977 OMA funding limitations reduced the budget to the minimum essential level and have placed many efforts in a high risk category with little or no flexibility to accommodate unforeseen requirements. These budgetary constraints significantly restricted accomplishment of planned objectives; however, every possible effort was made to minimize the impact on such high priority projects as those at Rocky Mountain Arsenal and Tooele Army Depot.

(U) Chart 24 is a review of the budget status for the overall chemical demilitarization program.

(U) Management actions taken to reduce the FY 1977 OMA budget requirements of \$38.019 million included deferring procurement and contractual services to the maximum extent possible, elimination of all contingencies to cover unforeseen technical or operational problems, reducing levels of effort to minimum essential, and complete deferral of lower priority projects. Specific actions relating to FY 1977 budget execution at a decremental level included changes in the technical direction of the Unserviceable Munitions and ID Sets projects which reduced scope of effort, deferral of the planned write-off on the Rocky Mountain Arsenal AIF of the excess M34 cluster spare parts inventory estimated at \$1.203 million, and deferral of Demil Technology Studies estimated at \$1.865 million to improve personnel safety and establish required environmental controls. For the last two years the demil technology efforts had been impacted as a result of funding shortfalls which precluded the development of new advances in the field of demil processes and personnel safety and protection.

Rocky Mountain Arsenal Stockpile

(U) The completion of the Honest John, bulk storage, and M34 projects in FY 1976 considerably reduced the stockpile of agents at Rocky Mountain Arsenal. Up to the end of this fiscal year, about 1,464,197 gallons of various toxic agents had been destroyed. At the beginning of FY 1977, only 34,258 gallons of nerve agent GB in Weteye bombs and 180,000 gallons of carbonyl chloride, stored in 1,294 ton containers, remained at Rocky Mountain Arsenal. During FY 1977, the amount of these agents remained virtually unchanged, except for the disposal of one leaking Weteye bomb (about 38 gallons) and the transfer of approximately 8,000 gallons of carbonyl chloride.

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CHEMICAL DEMILITARIZATION PROGRAM TASK LIST

COMPLETED TASKS

| <u>TASK</u> | <u>LOCATION</u> | <u>ACTUAL COMPLETION</u> |
|--|--|------------------------------|
| Biological Stockpile | Multiple | October 1972 |
| Leaking M55 Rockets | Johnson Island | November 1973 |
| Bulk Mustard | Rocky Mtn. Arsenal | March 1974 |
| GB in Underground Tanks | Rocky Mtn. Arsenal | November 1974 |
| Agents in Concrete Drums (Phase I) | Edgewood Arsenal, Edgewood Area, Aberdeen Proving Ground | August 1975 |
| GB in Ton Containers | Rocky Mtn. Arsenal | February 1976 |
| Honest John Warhead/M139 Bomblets (GB) | Rocky Mtn. Arsenal | August 1976 |
| M34 Cluster Bombs/M125 Bomblets (GB) | Rocky Mtn. Arsenal | September 1976 |
| Dugway Proving Ground Phase I (M55 Rocket (GB)) | Dugway Proving Ground | September 1976 |
| Dugway Proving Ground Phase II (M139 Bomblets (GB)) | Dugway Proving Ground | September 1977 |

Chart 22

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CHEMICAL DEMILITARIZATION PROGRAM TASK LIST

CURRENT MAJOR TASKS

| <u>TASK</u> | <u>LOCATION</u> | <u>SCHEDULED COMPLETION</u> | <u>STATUS</u> |
|---|-----------------------|-----------------------------------|---|
| CAMDS | TEAD | FY85 | FACILITY READINESS DATE - OCT 77 OPERATIONAL READINESS DATE - OCT 78 |
| RMA DEMIL ACTIVITIES | RMA | | |
| WETEYE BOMBS | | | PENDING TRANSFER TO TEAD |
| CARBONYL CHLORIDE (SALE) | | OCT 79 | CONTRACTOR DELAY |
| ID SETS | | 30FY81 | SYSTEM MODIFICATION/FABRICATION |
| TC BURN | | FY81 | OPERATIONS |
| WASTE SALTS | | INDEF | AWAITING EPA DISPOSAL GUIDANCE |
| DPG POST DEMIL ACTIVITIES (BRINES, SCRAP) | DPG | INDEF | CONTINUING |
| DRILL & TRANSFER SYSTEM (DATS) | | | |
| PHASE I - PILOT TEST | DPG | OCT 78 | FABRICATION |
| PHASE II - LEAKING CHEM MUN | MULTIPLE | CONTINUING | PLANNING |
| PHASE III - RECOVERED CHEM MAT | MULTIPLE | CONTINUING | PLANNING - APG ASSESSMENT UNDERWAY |
| INCAPACITATING AGENT/MUNITIONS | TO BE DETER- MINED | FY 84 | LABORATORY STUDIES/INITIATED |
| TECHNOLOGY PROJECTS | | | |
| DEMIL PROTECTIVE ENSEMBLE | CSL | OCT 77 | AWAITING APPROVAL FOR MANNED AGENT TESTING |
| REAL TIME MONITOR | CSL | GB - COMPLETED HD - ACAMS-FY79 | GB - INSTALLED CAMDS DEVELOPMENT |
| DOSIMETER - GB/VX/HD | CSL | FEB FY 79/80/79 | DEVELOPMENT |
| LASER | BRL | UNDETERMINED | DEVELOPMENT |

AS OF 30 SEP 77

Chart 23

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CHEMICAL AMMUNITION AND TOXIC AGENT DEMILITARIZATION

OMA PROGRAM BUDGET STATUS

\$ in Millions

| <u>PROJECTS</u> | <u>FY7T & Prior</u> | <u>FY77</u> |
|---|-----------------------------|-------------|
| Rocky Mountain Arsenal | 102.424 | 8.301* |
| CAMDS | 10.104 | 8.962 |
| Dugway Proving Ground | 6.213 | 1.185 |
| BZ Demil | -- | .263 |
| ID and Training Sets (chemical neutralization system) | 8.393 | .385 |
| Demil Protective Ensemble | 2.339 | 1.456 |
| Biologicals | 14.329 | -- |
| Drill and Transfer System | -- | 1.014 |
| Recovered Chemical Material | -- | .042 |
| Other | 13.205 | 2.924 |
| Project Management | 5.307 | 1.551 |
| TOTAL | 162.314 | 26.083 |

*Includes ID Sets Incineration

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Rocky Mountain Arsenal Cleanup Operations

(U) The facilities at Rocky Mountain Arsenal used for the disposal of GB were undergoing cleanup and decontamination.

(U) Plans relative to cleanup, retention, and disposal of demilitarization equipment were prepared under the guidance outlined here. Equipment required for other demilitarization programs was to be identified and decontaminated to appropriate levels for the intended use. That equipment identified for mobilization base requirements was to be returned to XXX condition (surface chemical decontamination). Also, equipment identified as having Defense Industrial Plant and Equipment Center applications was to be decontaminated to XXX with user paying for transportation. If required, the balance of equipment was to be surface decontaminated to XXX and left in place.

Weteye Bomb

(U) The demilitarization of the Navy's Weteye bombs was initially scheduled to commence at Rocky Mountain Arsenal in early 1976. However, operations were deferred at the request of the Navy to permit consideration of retaining the item in the active inventory and moving them from Rocky Mountain Arsenal to Tooele Army Depot for storage.

(U) Equipment needed for the Weteye disposal was installed at Rocky Mountain Arsenal, tested, and placed in a temporary layaway pending a decision on the movement by the Secretary of Defense. All preparations for disposal operations were essentially completed. Minor modifications developed from limited equipment testing were being held in abeyance pending the demilitarization decision. Re-initiation of the disposal action would require 12 months for completion from date of decision. Disposal of one leaking Weteye bomb was completed March 1977.

(U) A DOD decision to retain the Weteye would necessitate further decisions and approvals associated with the development and coordination of a movement plan, preparation, and coordination of an environmental impact statement, and notification of local, state, and Federal agencies in advance of any movement of the Weteye stocks from Rocky Mountain Arsenal to Tooele Army Depot. As of September 1977, ARRCOM was completing the preparation of the final Environmental Impact Statement (EIS) to cover the movement. However, a decision by the Secretary of Defense relative to the retention and movement of the Weteye bombs from Rocky Mountain Arsenal to Tooele Army Depot had not been made.

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Carbonyl Chloride (Phosgene) Disposal

(U) Public Law 94-251 enacted by Congress, 29 March 1976, authorized the sale of approximately 2 million pounds of carbonyl chloride (phosgene) in 1,294 steel ton containers stocked at Rocky Mountain Arsenal and the shipment incident to sale.

(U) The final EIS was filed with the President's Council for Environmental Quality (CEQ) on 6 August 1976. Defense Property Disposal Service (DPDS), Battle Creek, Michigan, published, in August 1976, an invitation for bids on the purchase of the carbonyl chloride (Sale No. 01-7700), and on 15 October 1976 a contract was awarded to Chemical Commodities, Inc., Olathe, Kansas. Transfer operations commenced in November 1976. However, the contractor experienced difficulties in meeting the removal schedule and the contract was finally terminated in March 1977.

(U) In May 1977 the DPDS published another invitation for bids on the carbonyl chloride, and on 23 June 1977 a contract was awarded to Arapahoe Chemical Inc., Newport, Tennessee (Sale No. 01-7001). On 13 July 1977 Arapahoe Chemical initiated the first shipment from Rocky Mountain Arsenal, and on 7 September 1977 they began the return of the first batch of shipping containers. As of 30 September 1977, 60 full ton containers (TC) had been shipped from Rocky Mountain Arsenal.

Identification and Training Sets (ID)

(U) There were approximately 21,000 unserviceable and obsolete chemical agent ID sets located at 29 US military installations throughout the world. These included basic categories of sets containing eleven different agents, with a maximum of five different agents in any one type of set.

(U) Current program planning was for all sets to be collocated for incineration at Rocky Mountain Arsenal. This effort was to be accomplished in two phases. Phase I was the pilot disposal tests of 1,750 sets slated for October 1978. Phase II, the disposal of the remaining sets, was scheduled to begin April 1979.

(U) An engineering study¹¹ to evaluate existing furnace capabilities at Rocky Mountain Arsenal for incineration of the sets was completed and recommended use of the Honest John Facility with the

¹¹ Scott, John and others, Edgewood Arsenal Report Number EM-CR-77027, Feb 77, Engineering Study of the Incineration Facilities at Rocky Mountain Arsenal for the Demilitarization and Disposal of Obsolete Chemical Agent Identification Sets.

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addition of an afterburner. All documentation¹² for movement and disposal of the pilot test quantity of 1,750 sets was completed and forwarded to DA and DARCOM. Letters were sent to local and state governments, as well as installations involved, advising them of plans for movement of sets.

DPG Phase II - Chemical Bomblets

(U) Phase II of Dugway Proving Ground demilitarization operations involved the disposal of approximately 1,200 GB-filled bomblets containing explosives and 600 GB-filled bomblets without explosives but containing live fuzes that remained at Dugway Proving Ground from prior testing.

(U) Although the schedule for training and demilitarization operations was set well ahead, and preparations were on schedule, some difficulty was experienced in the final stages of preparation due to the movement of chemical agents and munitions from Dugway Proving Ground to Tooele Army Depot and the associated conflict in personnel requirements. The movement was to take place as soon as the required waiting period had elapsed after filing of the EIS in the Federal Register. Uncertainty of the movement EIS filing date prevented the final scheduling of demilitarization operations until priority was given to the demilitarization operation by the Department of the Army.¹³

(U) Disposal operations were initiated in July 1977 and completed in September 1977. The bomblets were destroyed by caustic immersion utilizing a bubble breaker to minimize agent emissions as was used for the rockets in Phase I. The destruction was documented by a Basic Plan¹⁴ and EIS¹⁵ prepared as supplements to the Phase I documents, and the final project report was being prepared.

¹² Final Environmental Impact Statement, Disposal of Chemical Agent Identification Sets at Rocky Mountain Arsenal, CO, September 1977.

Pilot Test Plan, Disposal of Chemical Agent Identification Sets at Rocky Mountain Arsenal, Colorado, Phase I, Pilot Testing, Jan 77.

Operations Plan SETCON I, Disposal of Chemical Agent Identification Sets at Rocky Mountain Arsenal, CO, Jan 77.

Public Affairs Plan, Disposal of Chemical Agent Training Sets at Rocky Mountain Arsenal, CO, Phase I, Pilot Testing, Apr 77.

¹³ Msg, DAMO SSC, 111520Z May 77, subj: Priority of Operations.

¹⁴ Supplement A to Basic Plan, Disposal of Toxic Residue at West Granite Disposal Area, Dugway Proving Ground, UT, Dec 76.

¹⁵ Supplement A to Environmental Impact Statement, Disposal of Toxic Residue at West Granite Disposal Area, Dugway Proving Ground, UT, Jan 77.

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Dugway Proving Ground Phase III - Agents Without Explosives

(U) Phase III of DPG operations involved the disposal of 14,201 pounds of G and V agents and about 270 assorted GB and VX munitions without explosives. It was originally planned to dispose of these agents by draining them from the munitions and transferring them to ton containers, neutralizing the agents and decontaminating the metal parts. Operations were scheduled to be conducted in Building 3008 at Dugway Proving Ground using the existing agent neutralization reactor.

(U) However, at the direction of the Department of the Army,¹⁶ onsite disposal planning for Phase III was suspended in June 1976 and plans were prepared for transporting both the Phase III and IV agents and munitions to TEAD for retention or disposal. The movement of these munitions was completed in August 1977, thereby closing out this onsite demilitarization task.

Dugway Proving Ground Phase IV - M155 Rockets/M23 Land mines

(U) The Phase IV operations at DPG called for the disposal of 1,021 M55 rockets filled with GB or VX and 141 VX-filled M23 land mines.

(U) This plan developed for Phase IV munitions called for onsite disposal with the munitions being drilled and drained in the DPG suppressive shielding facility. The recovered agent would then be moved to Building 3008 for neutralization under the same procedures as were planned for under Phase III.

(U) As in the case of DPG Phase III - Agents Without Explosives, onsite disposal planning for Phase IV was suspended. Plans were prepared for transporting these munitions to TEAD for retention or disposal. This onsite demilitarization task was closed out in August 1977 after the movement of the munitions was completed.

Chemical Agent Munitions Disposal System (CAMDS)

(U) CAMDS was the prototype demilitarization facility which had been developed at the south area of TEAD, about 45 miles southwest of Salt Lake City. It originated as a transportable disposal system for GB-filled M55 rockets and was later expanded to include all nerve agent and mustard-filled munitions (less the Honest John warheads and Weteye bombs) and limited quantities of bulk stocks.

¹⁶ Msg, DAMO-ODC, 151533Z Apr 76, subj: Consolidation Planning.

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(U) The CAMDS prototype was to serve primarily to pilot the equipment and processes required to dispose of unserviceable chemical munitions, as well as the chemical stockpile, if required. It would also be used to demilitarize approximately 120,000 unserviceable chemical munitions of various configurations stored at TEAD.

(U) A total of \$43.3 million was the cost of the CAMDS acquisition phase, which included development and fabrication costs through FY 1976 plus engineering and test support. The cost of the CAMDS systemization phase, involving engineering testing and test support costs in FY 1977, ran approximately \$9.7 million. A \$57.9 million operating budget had been proposed to cover operations, engineering support and any further development/systemization costs from FY 1978 through FY 1984.

(U) During the past year the date for the initiation of toxic operations was revised several times, primarily due to the non-availability of the new demilitarization protective ensemble (DPE) required for CAMDS operations. The "earliest" target start date (January 1977) was missed due to delays in equipment installation, preparation of SOP's and training, labor problems, contractors and sub-contractors, and difficulties in attracting mid-managers and senior engineers to the CAMDS Directorate. In order to compensate for personnel/management deficiencies and provide additional technical expertise, PM CDIR personnel were relocated to Tooele Army Depot in January to participate in the management and technical aspects of the program. Later in the spring, when the availability date of the new DPE was extended until the summer of 1978, a facility readiness date of October 1978 was established for the demilitarization of the M55 GB rocket system. With the establishment of an extended facility readiness date, the use of large scale overtime on the program was curtailed and hiring freezes were imposed on non-critical positions. In accordance with the October 1977 facility readiness schedule, an operational survey was held in May and another is scheduled for October 1977.

(U) The CAMDS draft operational plan¹⁷ and EIS¹⁸ were staffed through DARCOM, DA, and DDESB in the fall of 1976. DHEW's comments on the CAMDS demil plan had been expected in January 1977; however, these comments were delayed and had not been received by 30 September 1977. The final EIS for CAMDS operations was expected to be filed during 1st Quarter 1978.

¹⁷ Draft Demilitarization Plan, Operation of the Chemical Agent Munitions Disposal System (CAMDS) at Tooele Army Depot, UT, March 1977.

¹⁸ Final Environmental Impact Statement, Operation of the Chemical Agent Munitions Disposal System (CAMDS) at Tooele Army Depot, UT, March 1977.

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(U) The pre-operational test with M55 GB rockets was to be conducted after the plan and EIS were approved.

Demilitarization Protective Ensemble (DPE)

(U) Based on a November 1975 decision by the DA Surgeon General, the CAMDS facility would not be allowed to go operational until a new DPE became available. The ensemble had been developed, but the test program was not completed.

(U) In December 1976 a protocol to govern the conduct of human volunteer testing of the DPE in a nerve agent environment was submitted to the Army Surgeon General. In May 1977 the DA General Counsel advised that one of the protocol review committees was improperly constituted and recommended compliance with the Federal Advisory Committee Act. In September 1977 the Office of Management and Budget rejected the request to establish an advisory committee. The DA General Counsel and the Surgeon General agreed to the establishment of a non-DOD Federal Committee to review the protocol. At the end of FY 1977, the committee had not been established and it was anticipated that it would be formed, and the required review of the protocol completed during 2d Quarter FY 1978.

Drill and Transfer System (DATS)

(U) The programs for the disposal of leaking chemical munitions and DPG Phase V test residue munitions were consolidated under a new program for the development of a Drill and Transfer System (DATS).

(U) A requirement existed to dispose of a growing inventory of leaking chemical munitions (LCM's) stored at Army depots at Lexington-Blue Grass, Kentucky; Anniston, Alabama; Tooele, Utah; Umatilla, Oregon; Pueblo, Colorado; Pine Bluff Arsenal Arkansas; and Johnston Island in the Pacific Ocean. In addition, chemical munitions and suspected chemical munitions were being recovered from various test ranges and development centers. These recovered chemical munitions (RCM's) required demilitarization and, where compatible with the equipment, could have been processed by DATS.

(U) The LCM's, with their overpacks, will have been placed in a transportable glovebox, removed from their overpack, and drilled. The agent fill was to have been verified, transferred into an ICC approved container, and stored for later transport to a detoxification facility. The munition body was to be chemically decontaminated to a XXX level, and explosively configured items were to be detonated.

(U) A pilot test of the DATS was scheduled for 4th Quarter FY 1978 using LCM's and RCM's from the Phase V assessment effort at DPG. The glovebox system was being fabricated by Large Caliber Weapons Systems Laboratory, Dover, New Jersey, with support from CSL.

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Disposal of Incapacitating BZ Agent/Munitions

(U) In August 1976 the Army's Deputy Chief of Staff for Operations and Plans added the responsibility for the demilitarization of military incapacitating agents to the Project Manager's Charter.¹⁹ A revised concept plan for the demilitarization of bulk incapacitating agent BZ, its munitions system, and a large amount of contaminated waste was submitted to DA and approved in August 1977.²⁰

(U) Production and stockpiling of incapacitating agents went back to 1st Quarter FY 1962 when the Army's Chief Chemical Officer submitted plans for the adoption of BZ as a military incapacitating agent. Approximately 100,000 pounds of the agent were manufactured by Millmaster Chemical Corporation, packed in 16-gallon drums and shipped to PBA. During 3d Quarter FY 1962, the agent and two aerial delivery systems, the M43 bomb cluster and the M44 generator cluster, were type classified as Standard B. Production of the munitions began at PBA during 3d Quarter FY 1963 and was completed during 3d Quarter FY 1964. This material had been in storage at PBA since manufacture.

(U) Limited technical investigations to define demilitarization and disposal process options had been initiated and was to continue for an estimated 16-24 months. These investigations included laboratory incineration studies at PBA; a BZ toxicity problem definition study at US Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Maryland; an analysis/detection screening investigation under contract; and munitions sensitivity investigations at ARRADCOM.

Laser Technology Program

(U) In FY 1975 and FY 1976 the Ballistic Research Laboratory (BRL) at Aberdeen Proving Ground (APG), Maryland, demonstrated the feasibility of cutting explosives using a multi-mode laser beam extracted from a 3KW CO₂ laser. The ability to sever munition nose closures and fiberglass encased M60 rockets (M55 rockets sans energetics and agent) was also shown at that time.

(U) In February 1977 BRL began the second phase of the laser technology program which involved a rocket feasibility study with live rockets filled with agent simulants. Little progress was made during the remainder of FY 1977 due to delays encountered in developing the laser test site at APG's Spesuti Island. The test site is scheduled to be completed in 2d Quarter FY 1978.

¹⁹ Ltr, DAMO-ODC, HQDA, 16 Aug 76, subj: Chemical Demilitarization and Installation Restoration.

²⁰ Ltr, DAMO-SSC, HQDA, 31 Aug 77, subj: Revised Concept Plan for Demilitarization of Incapacitating BZ Agent and munitions.

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Lethal Agent Demilitarization Process Optimization Program (LADPOP)

(U) This program was intended to improve the lethal chemical agent demilitarization process technology by evaluation and adoption of safer and more cost effective process technologies. These improved process technologies were to eventually be applied to CAMDS and were to be available, if required, to demilitarize the lethal chemical agent stockpile.

(U) Specifically, process improvements in broad areas such as furnace effluent scrubbing, agent detoxification methodologies, and munition handling and processing technologies were to be evaluated. The PM CDIR approved the development management plan in September 1977 and efforts were initiated. The first task specified in the management plan was to identify and evaluate candidate scrubbing processes which potentially offered economic and/or safety advantages over the current NaOH scrubbing process used on the CAMDS furnaces.

Hydrogen Cyanide (HCN) Disposal Program

(U) The 286 pounds of agent HCN remaining at TEAD were scheduled for disposal during FY 1978. It had been maintained in two AN-M79 1000-pound bombs.

(U) Three different methods were investigated for disposal: open air release, chemical neutralization, and incineration. Incineration in the APE 1236 deactivation furnace was chosen to minimize the hazard zone as it was the most cost effective and ecologically acceptable approach.

(U) A feed and environmental control system was to be designed for the deactivation furnace during FY 1978. The disposal plan and draft EIS were to be staffed with DARCOM and DA during the 2d Quarter, FY 1978.

Lethal Agent Detection and Monitoring Equipment (LADAME)

(U) Experience in chemical demilitarization highlighted the need for a quick response, low level agent alarm. Existing alarms responded quickly only to high levels of agent. Also, in recent years NIOSH and OSHA had recommended the use of dosimeters capable of measuring the average concentration of toxics in a worker's breathing zone.

(U) The real time monitoring system program was started in May 1973 and its feasibility phase, which involved a number of candidate monitors for nerve agent, was completed in May 1974. Breadboard enzyme alarm systems were fabricated and tested in the M34 cluster plant in 1975. The enzyme system could detect GB at the Threshold Limit Value (TLV) in eight to 12 minutes. Bendix has installed prototype units at CAMDS for user evaluation. It was anticipated that these units could be modified for VX use.

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(U) Prototype mustard monitors had been built, but would require improvements to meet sampling time and chemical interference requirements. This program was in abeyance pending result on the Automatic Continuous Air Monitoring System (ACAMS) development which had the potential of meeting the mustard monitoring requirements.

(U) A GB dosimeter system was in intensive development with the objective of having a miniaturized GB bubbler available for use and evaluation at the start of CAMDS demilitarization. Also, an investigation was being conducted on solid sorbents for GB and mustard. A VX dosimeter might have been derivable from the bubbler GB work because the same colorimetric enzymatic method could have been used for analysis.

(U) Demilitarization of the obsolete chemical agent ID sets presented a unique situation as several agents were to be disposed simultaneously. Monitoring for each agent individually at several locations with current methods of analysis required a large laboratory support effort. State-of-the-art instrumental techniques were capable of rapidly detecting, identifying, and quantifying trace airborne contaminants on an automated basis and offered the opportunity of greatly reducing manpower support requirements for atmospheric monitoring.

(U) The monitoring and detection equipment resulting from the LADAME program had application not only demilitarization but in chemical munitions production, maintenance, and surveillance.

Installation Restoration

(U) Continuing installation restoration (IR) projects as the beginning of FY 1977 included records searches at various Army installations; the containment/treatment of migrating contaminants at Rocky Mountain Arsenal; a preliminary survey of Aberdeen Proving Ground; a detailed survey and assessment of Weldon Spring Chemical Plant (WSCP), Missouri; and contaminant abatement at Pine Bluff Arsenal.

(U) Two new IR projects were assigned to the PM CDIR during FY 1977. In late June 1977, at the request of the Commander of ARRCOM, PM CDIR assumed technical responsibility for decontamination of Frankford Arsenal (FFA), Pennsylvania. In September 1977, Headquarters, DARCOM requested PM CDIR to assist the Commander, US Army Missile Materiel Readiness Command (MIRCOM) in developing measures for containment of cleanup of DDT contamination at Redstone Arsenal (RSA), Alabama.

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(U) In July 1976 DOD designated the DA as the lead service to improve or develop new restoration technology and determine standards for CBR contamination at installations assigned to the other military departments. This responsibility was subsequently assigned to the PM CDIR. A concept plan implementing this responsibility was prepared by PM CDIR and staffed with the Navy and Air Force during FY 1977. The plan provided for interfacing with the other Services to identify those installations that might have warranted some degree of restoration, the types and extent of contaminants, and the required technology development effort. The installation assessments/surveys and decontamination operations were to be conducted by the responsible military department, using technology developed by PM CDIR.

Records Search

(U) In FY 1977, the historical records of 11 Government installations were scrutinized. Of these, eight searches were performed to uncover indications of contaminant migration, and three were in support of ongoing projects. The installations included:

- * Fort Detrick, Maryland
- Weldon Spring Training Area, Missouri
- Fort McClellan, Alabama
- * Badger Army Ammunition Plant (BAAP), Wisconsin
- Charleston Army Depot, South Carolina
- * Hawthorne AAP, Nevada
- McAlester AAP, Oklahoma
- * Naval Weapons Support Command, Crane, Indiana
- * Frankford Arsenal, Pennsylvania
- * Pine Bluff Arsenal, Arkansas
- * Rocky Mountain Arsenal, Colorado

(U) Follow-on field surveys were being performed, or had been recommended by PM CDIR, at those installations marked with asterisks. At the remaining four installations, the records searches did not reveal indications of contaminant migration from past operations. In most instances, collection of additional general water quality data was recommended to provide additional evidence to support the conclusion.

Rocky Mountain Arsenal (RMA)

(U) The major tasks associated with the Rocky Mountain Arsenal installation restoration project during FY 1977 included a comprehensive survey to quantitatively define the types and locations of migrating contaminants and their effects on the environment. Others were the development of standards to establish acceptable levels of contamination and emission, and the development of technology to include piloting of decontamination procedures and processes.

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(U) Since the comprehensive survey of Rocky Mountain Arsenal involved the analysis of thousands of samples to thoroughly define the sources of migrating contaminants, complex extraction and analytical techniques had been automated to handle the workload. Pilot and pre-pilot plots, 1000 square feet each, had been used to develop specific methodologies.

(U) Soil and groundwater samples were analyzed to identify and quantify the types of contaminants. Heavy contamination concentrations were found in Basin A and Basin F areas. This contamination consisted of pesticides and their intermediates, heavy metals, and certain inorganics. These data were to be used to design initial sampling area priorities in the comprehensive survey to quantify the sources, mode of transport, and rate of migration of water pollutants.

(U) A new analytical support laboratory was established during the 1st Quarter, FY 1977 and used extensively throughout the remainder of the year. Work continued on developing automated analytical methods for chemicals identified in RMA waters.

(U) Toxicology studies to develop a data base for environmental standards for diisopropylmethylphosphonate (DIMP), dicyclopentadiene (DCPD), and three sulfur compounds identified in RMA groundwater were continued in FY 1977 in the standards development program. Aquatic and vegetative toxicity studies on DIMP and DCPD were completed; mammalian, wildlife, and domestic animal toxicity studies were in their final stages. Interim guidelines of 0.5 parts per million (ppm) for DIMP and 1.28 ppm for DCPD in drinking water were established. Problem definition studies to identify toxicological data existing on 22 top priority compounds also were completed, and research was underway on 13 additional compounds.

(U) Ecology work in support of the comprehensive survey involved the inventory and monitoring of plants and animals to determine contamination effects. Procedures for Survey of animals and plants were completed, and infrared photography of the arsenal had been conducted to outline a detailed vegetation map. An Installation Restoration Ecology Plan for Rocky Mountain Arsenal, FY 1978-1979, was prepared and approved by the Project Manager, and surveys of various animal and plant species were underway.

(U) During FY 1977 work in technology development was directed toward a pilot containment/treatment system that was to be employed at Rocky Mountain Arsenal. The configuration of one candidate system was established and design criteria developed. This pilot system, to be located in the vicinity of the north boundary, was to be composed of a series of pumping wells, a bentonite clay cutoff barrier, a granular carbon water treatment facility, and groundwater recharge wells. Installation of the system was scheduled to be completed in FY 1978. Feasibility studies to control sources of migratory contamination were also initiated in FY 1977.

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(U) An automated data processing system was established because the data generated from the IR project was voluminous and had to be analyzed immediately and continuously to guide daily operations and effectively manage a program of such complexity. The data base was being loaded with input from the comprehensive survey, standards development, and technology development efforts. During FY 1977 over 40,000 data records were filed in the main computer at Aberdeen Proving Ground, Maryland and a complete systems analysis which identified hardware and software requirements was completed. Hardware procurement was accomplished and equipment installation was in the final stages at the end of FY 1977. Software packages for data retrieval were being designed and tested. Various computer programs were being developed to utilize the data base for management decisions.

Aberdeen Proving Ground, Maryland

(U) A records search²¹ effort at Aberdeen Proving Ground (APG) was completed in July 1976. Based on the findings of the search and evaluation, migration of chemical contamination from past operations was suspected in the Edgewood Area of APG (formerly Edgewood Arsenal).

(U) It was concluded that a preliminary survey (involving limited soil and water sampling and geohydrology studies) should be conducted at APG to either confirm or rule out the presence and/or migration of contaminants.

(U) A preliminary survey of the Edgewood Area was begun in November 1976. Three suspect areas were surveyed during FY 1977 with no confirmed migration being discovered. A survey of the remaining sections of the Edgewood Area was to be initiated in the 1st Quarter, FY 1978 and should be completed by the 2d Quarter, FY 1978.

Weldon Spring Chemical Plant, Missouri

(U) During the 4th Quarter, FY 1976, DA directed PM CDIR to conduct a comprehensive survey of the Weldon Spring Chemical Plant (WSCP). A contract solicitation was prepared outlining the objectives which included performance of needed survey tasks, and development of environmentally acceptable and economically feasible disposition alternatives. In addition to comprehensive radiological surveys of the terrain and buildings, the project scope also included ecological work, a determination of the extent of contamination contained in equipment, duct work, sewers, process lines, and an evaluation of health and safety hazards

²¹ Records Evaluation Report 101, Installation Assessment of Aberdeen Proving Ground, Office of the Project Manager for Chemical Demilitarization and Installation Restoration, Sep 1976.

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which could result from natural disasters. The scope of the work was coordinated with the Department of Energy (formerly Energy Research and Development Administration), whose personnel served on the contract technical advisory panel.

(U) Solicitation release took place in the 1st Quarter, FY 1977, and was followed by an onsite pre-proposal conference for potential bidders. Twenty-two corporations received the solicitation package and 16 of these were represented at the pre-proposal conference. The solicitation period closed in the 2d Quarter, FY 1977 with six proposals being received.

(U) In the 3d Quarter, FY 1977, the contract was awarded to Ryckman, Edgerley, Tomlinson and Associates of St. Louis, Missouri, and a PM CDIR field office was established at WSCP. Phase I of the contract which called for preparation of detailed survey plans and of health physics and safety plans ended late in the 4th Quarter, FY 1977.

(U) Phase II, the execution of survey plans, was to begin in the 1st Quarter, FY 1978. The Detailed Survey and Assessment of Alternatives contract was scheduled to be completed in FY 1978. Also, a Non-real Property Disposal Plan was to be prepared, and the decontamination criteria for WSCP was to be developed.

Pine Bluff Arsenal, Arkansas

(U) The IR program at Pine Bluff Arsenal (PBA) in FY 1977 essentially involved two activities, the adequate containment of DDT manufactured in the past at the arsenal, and the determination whether other contaminants from past arsenal operations posed a problem to the off-arsenal environment.

(U) DDT Containment. From FY 1976-1977 PBA undertook to contain the DDT materials²² that, since the time of their deposit in 1948-1957, had acted as the source of surface migration through the arsenal's drainageways and creeks and into the Arkansas River. These source deposits in crystalline form, were located at several scattered sites on post.

(U) In the south part of the arsenal, a stream (White Creek) was diverted around the DDT landfill and the landfill itself was covered with clay, compacted, surfaced with topsoil, sloped, and seeded. In FY 1977 the area was fenced off, posted with warning signs, and thereafter visually monitored to ensure the continued integrity of the seal.

²² Pinkham, C.F.A., J. H. Pearson, J.J. Fuller, and E.S. Bender, Edgewood Arsenal Special Publication EB-SP-74025, Mar 75, Preliminary Environmental Survey, Pine Bluff Arsenal.

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(U) In the north part of the arsenal, where the DDT had been manufactured, more elaborate measures were necessary. After three sediment retention basins were constructed, each "downstream" from a major DDT deposit, the DDT material was scooped up, and placed in the emptied foundations (basements) of previously razed buildings. As in the south area, the basements were thereafter sealed off, with clay, compaction, topsoil, sloping, seeding, and fencing.

(U) While the basements were sufficient in volume to accept the crystalline and concentrated DDT material, a large volume of contaminated soil was also loosened by the scooping and grading. This contaminated dirt was gathered on the property adjacent to the manufacturing site and covered with its own clay and topsoil.

(U) In accordance with the original plan, PBA was to dredge periodically the sediments collected in the three sediment retention basins and remove them to the manufacturing site for containment along with these lesser-contaminated soils. Thus, the initial effort in curtailing the migration of DDT successfully ended with the encapsulation of the concentrated bulk material that had been exposed on the ground surface for several decades.

(U) Determination of Other Contaminant Migration. In a sampling and analysis program dealing with the contaminants other than DDT which might have been migrating off the arsenal, the work was separated into two aspects, i.e., surface and subsurface.

(U) In the surface aspect, the waters and sediments of the arsenal's major drainageways were sampled in March-April 1977. Samples were thereafter subjected to both chemical analyses (by PBA) and biological analyses (by the Ecological Branch, CSL). The biological analyses were intended to detect evidence of environmental stress, from contaminants, as reflected in the population abundance and diversity measurements. By the end of the year, the analyses were nearing completion and the statistical reduction of the data was beginning so that conclusions concerning surface migration could be drawn.

(U) In the subsurface aspect, some 109 core-samples were taken at various locations on the arsenal. All corings were drilled down to where groundwater could be found and water-sampling wells were installed. The analyses of these wells were continued through the remainder of the year and were scheduled to conclude in FY 1978.

(U) Soil samples were analyzed chemically for a battery of analytes, and then shipped to the Waterways Experimental Station, Vicksburg,

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Mississippi, where they were subjected to physical analyses (soil constitution, permeability, and density). The end-result of the physical analyses was three-fold.²³

1. A determination of the groundwater flow paths and rates.
2. A model (mathematical) to predict the routes and dispersion of contaminants in the groundwater, with time.
3. An assessment of what sites were suitable for the long-term storage of contaminated soils, should it be necessary to store such soils.

Frankford Arsenal, Pennsylvania

(U) Frankford Arsenal (FFA) was a 110-acre facility located within the City of Philadelphia. The arsenal was founded in 1816 and used as a general storage and distribution depot for ammunition, small arms, artillery, and cavalry equipment.

(U) Prior to the decision to close the arsenal, the FFA mission was to research, develop, design, engineer, procure, supply and/or service small caliber munitions, cartridge actuated and propellant activated devices. Research was conducted in the field of optics, metallurgy, material degradation, tracers, and laser countermeasures. It performed support mission responsibilities for artillery shell metal parts and cartridge cases, mechanical time fuzes and mechanical timing devices; as well as for fire control material in support of the US Army field units. As a result of the various mission activities performed at FFA, explosive/pyrotechnic, radiological, and industrial chemical contamination is suspected in various areas of the arsenal.

(U) A records search effort was completed at FFA in July 1977. The search team reviewed pertinent documents and interviewed present and former key employees. Information was also gathered from other government agencies including DDESB, US Army Environmental Hygiene Agency (USAEHA), US Geological Survey (USGS), Defense Documentation Center (DDC), and the National Technical Information Service (NTIS.)²⁴

(U) The results of the records search revealed that approximately 102 of the 212 buildings at FFA were potentially contaminated. In addition, six areas were identified where unexploded ordnance burial sites were suspected.

²³ Grougton, J. D., Draft Report, Feb 76, A Literature Survey on Surface and Subsurface Characteristics at Pine Bluff Arsenal, AR.

²⁴ Records Evaluation Report 115, Installation Assessment of Frankford Arsenal, Philadelphia, PA, Oct 77.

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(U) A concept decontamination plan was prepared and briefed to AARCOM, DARCOM, HQDA, and Assistant Secretary of the Army for IL&FM.²⁵ The plan consisted of three phases: Phase I provided for a detailed survey and alternatives assessment; during Phase II the methodology required for decontamination would be developed; and during Phase III the decontamination operations would be carried out.

(U) The Phase I evaluation, to be accomplished by a joint in-house/contractor approach, was to get underway during 1st Quarter, FY 1978 and was to be completed by September 1978.

Redstone Arsenal, Alabama

(U) Redstone Arsenal (RSA) was the site of a DDT production plant operated by lessee from the Army for commercial purposes. Production operations began in 1947 and were terminated in 1970 when the plant was unable to meet stringent DDT emission standards in wastewater streams. The plant was demolished in 1972 and DDT-contaminated areas of the plant site were chemically treated to destroy DDT according to acceptable procedures.

(U) During the operational period, wastewater containing DDT residue was discharged through an open ditch to a stream passing through the arsenal and joining the Tennessee River. This caused the major portion of the stream system within the arsenal and the adjoining Wheeler National Wildlife Refuge to become contaminated with DDT and its degradation products.

(U) Due to continued indications of DDT contamination, RSA in the 3d Quarter, FY 1977 requested the USAEHA to conduct a contamination survey of land, water, stream sediments, and animal life from the point of the old manufacturing site through the wildlife refuge to the Tennessee River. The survey, completed in July 1977, indicated heavy concentration of DDTR (all analogs and isomers of DDT) in the discharge ditch leading from the site, in sediments of the streams passing through the wildlife refuge, and in fish taken from the refuge and from the Tennessee River in the area of the arsenal. DDT levels found in some fish samples exceeded the five parts per million (ppm) guideline set by the Food and Drug Administration (FDA) for fish sold in interstate commerce. As a result, RSA notified the Environmental Protection Agency (EPA) Region IV, the State of Alabama, and local authorities of the potential health hazard. A public announcement of the problem was made jointly by RSA and EPA on 30 September 1977. With assistance from the PM CDIR, RSA initiated immediate plans for DDT contaminant measures in coordination with EPA, the Tennessee Valley Authority (TVA), and the State of Alabama Department of Health.

²⁵ Concept Plan, Installation Restoration of Frankford Arsenal, PA, Sep 77.

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Below is the FY 1977 Installation Restoration Program:

| <u>Project</u> | <u>Appropriation</u> | <u>FY 7T & Prior</u> | <u>FY 1977</u> |
|------------------------------|----------------------|------------------------------|----------------|
| Rocky Mountain Arsenal | | (4665) | (5324) |
| | OMA | 1211 | 2574 |
| | RDTE | 3308 | 2750 |
| | MCA | 146 | - |
| Weldon Spring Chemical Plant | | (72) | (583) |
| | OMA | 37 | 583 |
| | RDTE | 35 | - |
| Frankford Arsenal | OMA | - | 46 |
| Pine Bluff Arsenal | OMA | 894 | 1229 |
| Installation Assessment | OMA | 304 | 961 |
| Project Management | | (519) | (1057) |
| | OMA | 519 | 1002 |
| | RDTE | - | 55 |
| TOTAL PROGRAM | | (6454) | (9200) |
| | OMA | 2965 | 6395 |
| | RDTE | 3343 | 2805 |
| | MCA | 146 | - |

Figure 10

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Mobile Electric Power

Introduction

(U) DOD Project Manager-Mobile Electric Power (PM-MEP) was activated 1 July 1967 by direction of the Secretary of Defense. The Secretary of the Army was designated Executive Agent for DOD for FSC 6115, Engine Generators, and was directed to appoint a project manager and to negotiate and issue a jointly approved charter. The mission of the Project Manager, as outlined in the charter, was to effect management and standardization of mobile electric power generating sources within DOD to meet military needs. Consistent with the mission, two priority tasks were assigned to the PM. One was the development of fully coordinated standardization documents and procurement data packages which would be used to procure the first DOD Standard Family of generator sets acceptable to the Services. DOD Directive 4120.11, "Mobile Electric Power" described the Family by classification, power rating and mode. The other task was the determination of the operational requirements for and definition of a DOD Standard Family of gas turbine engine driven generator sets and/or other power sources. This was referred to as the second generation of the DOD Family.

(U) Colonel Alvin G. Rowe was designated Project Manager-Mobile Electric Power, effective 1 August 1977.

Program

(U) Personnel Staffing. TDA XYWOWHAA effective 1 October 1976, authorized three military and 29 civilian positions for MEP. A change of the location of authorized Liaison Office was accomplished by disestablishing the Liaison Office located at Sacramento Air Logistics Center and establishing a Liaison Office at US Army Troop Support and Aviation Materiel Readiness Command, St. Louis, Missouri.

(U) During the 2d Quarter, FY 1977, the PM abolished one GS-13 position resulting in the reduction of total authorized civilian positions to 28. By direction of higher authority, the number of authorized senior level positions (GS-13 and above) was reduced from 21 to 18. The average grade authorized was reduced from 12:00 to 11:61.

(U) Program Requirements. The DOD Mobile Electric Power Generating Sources Program requirements for FY 1977 were as follows:

| | |
|-------------------|----------------|
| Army | \$23.9 million |
| Navy/Marine Corps | 16.5 million |
| Air Force | 25.9 million |

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(U) Joint Operating Procedures. The Joint Operating Procedures (JOP) for managing the Mobile Electric Power Generating Sources were revised and sent to the Services for comment. Joint meetings were held in January 1977 and July 1977 to resolve essential comments. Army, Air Force and Navy military construction elements voiced objection to the joint operating procedure definition of fixed and mobile generator sets. The definition in the JOP was identical to the definition in Department of Defense Directive 4120.11. All the Services, particularly Office, Chief of Engineers, protested to Office, Secretary of Defense to change the definition back to the original 1967 Department of Defense Directive. A PM-MEP thrust to DA and OSD was that PM-MEP could provide tactical generators from time to time to the military construction community if the tactical sets could be used in construction sites. Further, PM-MEP highlighted that the Ad Hoc study group that established PM-MEP recommended the establishment of a prime family of generator sets. MEP proposed to OSD and DA that the prime family should be established to meet the physical electrical characteristics desired by the military construction community. It was envisioned that the sets would be largely commercial but be previously qualified and placed on a "QPL" list such that construction contractors would be able to make direct purchase from manufacturers from the qualified products list.

(U) Engineering Support for Development Laboratories Under Integrated Materiel Management. Under Integrated Materiel Management the Army development laboratory was assigned responsibility for the first production contract and normally funds were made available from Army item funds. Other Services having requirements on the first production contract normally did not include funds for engineering support, and the Services typically objected to providing engineering support funds. It appeared that a major problem would exist in the future under Integrated Materiel Management wherein Army development laboratories would be making the initial buy but would be funded by the other Services.

Technical Management

(U) 291 Military Standard 633D; Mobile Electric Power Engine Generator Standard Family Characteristics Data Sheets, and Military Standard 1650; DOD Standard Family of Aircraft Ground Support Power Units. A preliminary draft which combines MIL-STD-633D and 1650 into a single document was prepared and circulated to the Services. Based upon comments received, changes in the draft had been made and in-house resolution of these changes were underway prior to the final coordination.

(U) MIL-G-28554, Packaging of Generator Sets, Mobile Electric Power. A project to revise MIL-G-28554 was initiated and Naval Facilities Engineering Command had scheduled completion in the 4th Quarter, FY 1978.

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(U) MIL-G-28670 A(ME), 3 May 1976 Generator Set, Gas Turbine Engine, 750 kW, 50/60 Hz Prime Utility was not approved for promulgation because a comprehensive development program would have had to be undertaken followed by extensive testing, and would have required an inordinate expenditure of time and money. Since a commercial set had already demonstrated a rotating group (gas turbine engine, a gear box and a generator) which was adequate, it was decided to procure the commercial set modified to meet the military requirements of the Services. A revised MIL-G-28670 Specification would be required to cover future requirements and a project had been scheduled for completion in FY 1981.

(U) An engineering practice study initiated to determine the feasibility of using a transformer on a 500 kW low voltage set was completed. Results indicated that high voltage distribution requirements could be met using the low voltage set.

(U) MIL-G-38195, Generator Set, Power Unit, A/M 32A-60. The project to revise MIL-G-38195 continued. The US Air Force was the preparing activity. Comments on draft specification were submitted to the attention of MMEM on 25 November 1975. This Project Office recommended that the specification be revised to be in accordance with the Defense Standardization Manual 4120.3-M, taking into account actual test data results on previous sets. Completion had been rescheduled from 2d Quarter, FY 1976 to 1st Quarter, FY 1978.

(U) Standardization Projects. There were four active standardization projects at the beginning of the year, three new projects were initiated, and three were completed. There were four active projects at the close of the year.

RDT&E Program

(U) TRADOC approved the concept of developing a 1.5 kW fuel cell power unit using methanol as a fuel. To keep the options open, advanced development of a fuel conditioner to produce hydrogen from DOD approved combat fuels was also recommended. Engineering support data for the TRADOC COEA had been provided for the 1.5 kW fuel cell power unit.

(U) Generator Set, (MEP-412A), Gas Turbine Engine Driven, 60 Hz, Tactical, Utility. The Army's developmental effort was continuing. Special In-Process Review was conducted 3 May 1977 at which time weight increase from 400 lbs to 456 lbs was approved. Also approved was the initiation of development effort on the 400 Hz version of this generator. Technical problems with bearings and carbon were solved and corrections verified by test. At 2500 hours of endurance testing, demonstrated Mean Time Between Failure (MTBF) was 320.5 hrs which was exceeding the Government's budgeted reliability projection of 225 hours at this point of testing. The unit was scheduled to start DT-II development testing in October 1977, and OT-II operational testing in November 1977.

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(U) Generator Set, D-423A, 10 kW, Gas Turbine Engine Driven, 400 Hz, Tactical, Utility. This set was being developed to support the FIREFINDER AN/TPQ-36 system, which required a lightweight generator. Type classified as a part of the AN/TPQ-36, the set will use a previously developed turbo-alternator with a specially developed power conditioner to provide a three phase, 400 Hz capability. This unit successfully completed AN/TPQ-36 Mortar Locating Radar System DT-II/OT-II tests. Production award was scheduled for January 1978.

(U) Generator Set, 30 kW, Gas Turbine Engine Driven, 50/60 Hz and 400 Hz, Tactical, Utility. HQDA directed termination of the development program for this set during 4th Quarter 1976 due to lack of a firm requirement increasing fuel cost, and higher priority requirements for the 6.4 funds. However, since termination, two major Army systems had stated requirements for the 400 Hz version of this set. Contract termination hardware had been placed on an indefinite hold to prevent loss of hardware should the decision be made to restart the program.

(U) Generator Set, 10 kW, Diesel Engine Driven, DC, Tactical, Utility. The US Navy Air Engineering Center developmental effort continued on a power source with integral wheels to support rotary and fixed wing aircraft. A low voltage generator had been wound and tested. Approximately 300 of 350 drawings were completed.

(U) Generator Set, 30 kW, Diesel Engine Driven, 400 Hz, Tactical, Precise, with capability to provide 22.5 kW DC power. The US Navy Air Engineering Center developmental effort continued on a four wheel, drivable, power source to support Naval and Marine Corps aircraft. Existing standard family member generator sets were examined for standard items that could be used in this power unit. The voltage regulator used on the standard family generator set had been modified for use on the breadboard model to reduce the response time (per MIL-STD-704). Use of a microprocessor in the control circuitry was under consideration but efforts were being limited because of lack of funding.

(U) Generator Set, 150 kW, 400 Hz, Gas Turbine Engine Driven. Development efforts had been initiated for 150 kW GTED set to provide the required PATRIOT prime power reliability and availability with substantial improvement in fuel economy over the present configuration. Basic hardware development was being performed by General Motors (GM) with a GM consigned set being made available in CY 1978 to MERADCOM for evaluation.

(U) Generator Set, MEP-414A, 10kW, 28 V DC, Gas Turbine Engine Driven. Approval for a Required Operational Capability (ROC) for an aviation ground support direct current (DC) generator was being expedited for this set. An urgent need existed for a replacement generator for the 7.5 kW ground support generator, which was no longer being manufactured and inventory was rapidly being depleted.

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Other Programs

(U) Generator Set, 60 kW (EMU-30EA), Gas Turbine Engine Driven, 400 Hz (Nuclear effects hardened version of the MEP-404A used by the Air Force). The Air Force, in response to a PATRIOT requirement, initiated a product improvement program to improve electronic reliability of this set. The contract was awarded to INET to analyze the cause of electronic failures and to develop preliminary ECP's. Improved electronics were incorporated and two generators were on test to verify improvements. This Project Office initiated action to establish a second product improvement program to improve mean time between overhauls and fuel economy of the T-62-32 turbine engine. Contract for the T-62-32 turbine engine improvement effort was awarded to Solar.

(U) Generator Set, 100 kW, Diesel Engine Driven, 50/60 Hz and 400 Hz, Tactical. The Caterpillar Model 333 engine, originally used with this set, was no longer in production. The replacement engine, Caterpillar Model 3306, was installed in two sets by CONDEC but over-temperature problems were experienced during high temperature tests. MERADCOM was testing modifications attempting to correct the over-temperature situation.

(U) Generator Set, 200 kW, Diesel Engine Driven, 50/60 Hz, Tactical. The Air Force, Sacramento Air Logistics Center, specification (including a new engine to replace the out of production engine) was reviewed and comment provided by this Project Office. The electrical characteristics were adjusted so that an individual set's precise power could be provided, but when used in parallel operation only utility power would be provided.

(U) Generator Sets, Aircraft Support: (1) Standard Family Members--The Joint Services agreed to a seven member family in 1975. Two sets were dropped in 1976, leaving five members in the family. At the end of FY 1977, the family consisted of six members. Two were in production and two fielding members under development. (2) Commercial Commodity Acquisition Program (CCAP)--As a result of the MAC demonstration of four generator sets at Travis AFB, a solicitation was prepared to procure 136 commercial ground support generator sets for use as MAC bases within CONUS. This CCAP Program was to also examine the problems and possibility of standardization on a commercial set.

(U) Extended Oil Change Program--The program was completed and the final MERADCOM report was expected to be completed and disseminated during Fiscal Year 1978.

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(U) Survivability--This Project was established to stress the need to include survivability, i.e., noise reduction, IR signature and electromagnetic interference (EMI), in all developmental programs. Accomplishments during 1977 included the development of several integral kits (both for noise and for IR signature) for the Army which were made for the 15 kW and 30 kW DED sets and the 5 kW and 10 kW GED sets. These kits had been assigned to V Corps in Germany for field evaluation. Other kits that were developed included the 1.5 kW acoustic and thermal kit for the GED set, and kits for the 5 kW and 10kW DED sets. The data accumulated during the evaluation of the field tests and in the Lab's identification of susceptibility analysis by CAC/MERADCOM Camouflage Lab/Engineering School was to be used as a base line for continuing efforts in the survivability area.

(U) Energy conservation and Environmental Emission Standards--As a result of national and DOD energy and environmental programs, this project continued study efforts to determine potential utilization of low fuel consumption and low emission engines. In addition, a continuing surveillance was being made on the impact of Federal, State, and local emission standards on the future engines for MEP,

(U) Development and Product Improvement Plan--To provide for orderly and coordinated evolution of MEPGS, the development and the product improvement plans of each Service were solicited for a DOD Mobile Electric Power Development and Product Improvement Plan. After coordination, the plan was published on 10 March 1976. This plan provided a background of current status of the DOD MEPGS, a review of technological capabilities, and a plan of action for orderly evolution of MEPGS to meet the requirements. A review and update of the revised plan was in progress.

(U) Vibration--As a result of vibration related failures on several sets, this Project initiated a program to develop vibration test and analysis procedures and to establish vibration limits for the MEP generator sets. Initial contact was made with the manufacturers to obtain baseline data.

(U) Nuclear Hardening of Mobile Electric Power Generators--A program had been initiated to nuclear harden all mobile electric generators in the Department of Defense. Areas of nuclear hardening program under investigation at that time included requirement-TRADOC, order of priority for hardening-TRADOC/PM-MEP, harden survivability-ANA, funding requirement-HDL, and policy on nuclear hardening of generators-HQDA.

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Logistics Management

(U) Provisioning. Production contracts for a generator set incorporated the necessary provisions to assure that hardware, drawings, provisioning lists and parts manuals were in agreement to assure the higher degree of accuracy. Contractors were then required to submit provisioning lists and draft manuals at the time of presentation of first articles for Government inspection. Failure of the contractor to have available an accurate provisioning list and manuals at the time of first article presentation provided a basis for refusing to inspect the first articles until deficiencies in the paper work had been resolved.

(U) Depot Maintenance. Integrated Materiel Management for generator sets had advanced in accordance with the joint logistics commander's regulation requiring a Service to be appointed as the primary inventory control activity wherein items were used by two or more Services. The assignments made in the joint operating procedures for mobile electric power were utilized and accepted by all Services for assignment of the PICA to include assignment of depot maintenance in accordance with the recommendations of PM-MEP. Defense Logistics Support Center (DLSC), Battlecreek, Michigan, reflected PICA responsibility for generator sets in accordance with those assignments carried in joint operating procedures.

(U) Materiel Fielding Plans/LOGCAP Briefings. One set was fielded during this period, MEP 007A, 100 kW 50/60 Hz DED Generator Set. DARCOM Headquarters was briefed on the fielding plan for 200 kW DOD generator sets, in anticipation of fielding in early FY 1978. The shortcomings and deficiencies detected during IPT were addressed and retrofit kits were developed and made available to the Services to upgrade the generator sets to eliminate the deficiencies. All Services had not completed installation of retrofit kits but were in a position to do so either before fielding end items to troops or after having fielded to troops. The Army position was to retrofit before issue to troops.

(U) Retrofit Programs. The modification work order for the 60 kW DOD generator sets was developed. After troops had been instructed to give proper preventive maintenance to generator sets was the major user, PM-HAWK Missile System, reported that the generator sets were performing in an outstanding manner, notwithstanding the absence of the application of the water pump modification kit. Following installation of this kit, the mean time between failure was expected to again increase. The new design water pump was installed on all new production 60 kW 60 Hz and 400 Hz generator sets being manufactured by Fermont under the new multi-year contract.

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Army Container Oriented Distribution System

Management Improvements

(U) While the Project Manager for Army Container Oriented Distribution System (ACODS) retained management overview of watercraft systems developed or procured for container use, the responsibility for development, procurement, or modification was transferred to the Product Manager, Army Watercraft. This mission realignment assigned total watercraft program responsibility to one PM instead of two. The PM ACODS, however, retained management overview of watercraft systems developed or procured for container use.²⁶

(U) Two additional military spaces were authorized to improve present project management control. A proposed manning level increased from 21 to 32 spaces was submitted 8 August 1977. If approved, this Office would have been able to participate fully in the development of hardware, doctrine, organizational structures, logistical support requirements, training programs, and long range system improvement projects.²⁷

(U) In the designation of intensified management programs, the project charter was reviewed to determine tasks that were critical to mission accomplishment. Four tasks were selected because they were considered sequential or phased building blocks required in developing an integrated container distribution system. These identified tasks were the development of system equipment, an interim logistics-over-the-shore capability, a system for commercial containers and container facility modernization programs.²⁸

(U) All new procurements provided for a two step procurement approach and contained a prior experience clause, as well as provided for multi-year procurements. This was done because off-the-shelf procurement of commercial equipment reduced the number of checks and balances normally found in developmental programs. Under the previous one-step procurement approach, contracts were awarded without requiring the contractor to provide a detailed technical proposal and to show prior experience in building the item. Under the two-step approach, this was done and the Army knew what it was buying before awarding the contract.²⁹

²⁶ Review and Command Assessment of Projects for Army Container Oriented Distribution System, 19 Sep 77

²⁷ Ibid.

²⁸ Project Management Overview for Army Container Oriented Distribution System, Jul 1977.

²⁹ Ibid.

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(U) A project identification code 55 was established for management and control of project funds to other commands involved in ACODS development.³⁰

(U) Support agreements were formalized with the US Army Troop Support Command (TROSCOM), US Army Mobility Equipment Research and Development Command (MERADCOM), US Tank Automotive Materiel Readiness Command (TARCOM), and the US Army Tank Automotive Research and Development Command (TARADCOM).³¹

ACODS Equipment/Procurement Programs

(U) Significant progress was made toward development of container handling and transport equipment, despite problems associated with some programs.³² An abbreviated overview and assessment for the individual system segments follows:

CONUS Segment. Satisfactory progress was made in the development or procurement of container handling equipment; the construction of required igloos and pads; and the establishment of container facility modernization programs. Container handling equipment was identified, procured and fielded, less sideloader requirement. Funds (\$3.9m) were programmed for modernization of MILAN and LONE STAR Army Ammunition Plants (AAP) with completion dates projected September 1980 and July 1981, respectively.³³

Line Haul Segment. Satisfactory progress was made in development and procurement of required transport equipment.³⁴

Port Segment. Marginal progress was made in the overall development and procurement of required equipment to handle and transport containers from ship-to-shore and over unimproved or semi-improved beaches.³⁵ The Army and Navy shared responsibilities for segment development.³⁶ Their collective developmental efforts

³⁰ Review and Command Assessment of Projects for Army Container Oriented Distribution System, 19 Sep 1977.

³¹ Ibid.

³² Ibid.

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Ibid.

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were tested during the Joint Logistics-Over-The Shore (JLOTS) test conducted during 6-20 August 1977. One objective of the test was to evaluate hardware, doctrine, organizational structures and training programs developed by the Services for the unloading, lighterage and shoreside subsystems.³⁷ A preliminary evaluation of test data indicated that the unloading and lighterage subsystems were marginal and the shoreside subsystem was satisfactory.³⁸

User/Field Unit. Satisfactory progress was made in equipment development and procurement for this segment, less items discussed in paragraph 2-2.³⁹

(U) In the 4,000-pound capacity, rough terrain, forklift, there were operational deficiencies found during testing of Pettibone's pre-production model. Action was taken to negotiate contract modification with Pettibone. If the negotiations were to result in an unresponsive proposal, the current contract would be terminated.⁴⁰

(U) The size and weight of the 50,000 pound capacity, rough terrain, container handler presented a transportability problem. Consequently, the FY 1977 procurement program was delayed, pending test and evaluation of two smaller models during September - December 1977. Plans were made to award a five-year, multi-year, procurement contract in late 1978.⁴¹

(U) Regarding the 50,000-pound capacity, container handler, side-loader, the Cochran Western Corporation submitted a second financial relief claim (\$5.2m) against the Government in October 1976. Subsequently, the contractor requested contract termination on a no fault basis with an offer to remit one-third of progress payments received. The case was pending Army Contract Adjustment Board approval.⁴²

³⁷ Joint Plan of Test, Joint Logistics-Over-The-Shore Main Test, 15 Jun 77.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

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(U) The 22½ ton semitrailer (XM871) development program was terminated March 1977 and was reoriented to procurement of a commercial design semitrailer. Subsequently, three different suspension systems were tested by the US Army Tank Automotive Research and Development Command (TARADCOM) to define the desired commercial configuration. On 31 August 1977, a special in-process review (IPR) examined test data and concluded that further semitrailer modifications and retesting were required. Program direction decision would be made in November 1977.

Restraint System for Commercial Containers

(U) The Department of Defense authorized a one time procurement of 4,500 restraint MILVAN containers to test and develop a containerized ammunition distribution system (CADS). Since this small military fleet was inadequate for supporting contingency or full mobilization ammunition shipment requirements, this office initiated action to identify, test, and procure a restraint system or combination of systems for commercial containers.⁴³

(U) A containerized ammo restraint system cost and readiness analysis was conducted by the US Army Mobility Equipment Research and Development Command (MERADCOM) to determine the required restraint system or combination of restraint systems for shipment of ammunition in commercial containers. MERADCOM recommended the wood dunnage or Navy Earle system or combination of the two.⁴⁴ A decision was to be made concerning system(s) to satisfy the requirement by November 1977.⁴⁵

(U) The Navy internal restraint kit (IRSKIT) tests were conducted, 30 August - 1 September 1977, to evaluate the IRSKIT developed by the Naval Weapons Handling Center (NWHC) for securing/restraining ammunition in commercial intermodal containers. These tests consisted of rail impacts (TOFC), rough road (including hazard and 30 mile courses) and United States Coast Guard imposed 80 percent tilts using containers loaded with various loads, i.e., 155mm and 105mm inert ammunition and inert M_k 82 bonbs. Although verbal approval was given for the system by American Association of Railroads Bureau of Explosives (BUEX) and

⁴³ Project Management Overview for Army Container Oriented Distribution System, Jul 1977.

⁴⁴ Containerized Ammo Restraint System Cost & Readiness Analysis, MERADCOM, Jun 1977.

⁴⁵ Review and Command Assessment of Projects for Army Container Oriented Distribution System, 19 Sep 1977.

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United States Coast Guard (USCG) representatives, its introduction into operations was to wait formal approval of load drawings by regulatory agencies. A package consisting of drawings, hardware procurement requirements and instructional documentation will be completed OA 1 October 1977 by NWHC and forwarded to appropriate agencies.⁴⁶ This office established requirements to test system in trial shipments of live ammunition during FY 1978.⁴⁷

Doctrine Development

(U) The containerized shipment and storage of ammunition (COSSA) study was completed by the US Army Logistics Center (LOGC), Fort Lee, Virginia to determine logistical doctrine and operational procedures required for delivery and limited intransit storage of conventional ammunition and missiles in intermodal containers. Three alternatives were identified (i.e., retention of containers on chassis, grounding or stripping of containers) for handling and/or storing containers in the Corps Storage Area (CSA) or the Ammunition Supply Point (ASP). The tactical situation and equipment availability was to dictate the alternative chosen.⁴⁸ The study was pending DA approval.

(U) A munitions system support structure (MS³) study was completed by the LOGC to determine doctrine and organizational structures required to command, control and operate conventional and special ammunition supply/maintenance activities. The study concluded, as it applied to containerization, that the full potential of containerizing ammunition could not be achieved because supply and maintenance units lacked an adequate container handling and transport capability.⁴⁹ The projected container handling and transport equipment would satisfy requirements for these units. The study was pending DA approval.

(U) The authorized stockage list (ASL) mobility study was conducted by the LOGC to determine divisional maintenance battalion's equipment needs for improving Class IX ASL mobility. As an interim solution, the study recommended issuance (MTOE augmentation) of 41 MILVAN container/chassis to each maintenance battalion of Armored, Infantry and Mechanized divisions.⁵⁰ While action had been taken to satisfy interim and long range solutions, the study was pending Department of the Army approval.⁵¹

⁴⁶ Ltr, USN Ammunition Depot Earle, Subj: Evaluation of Navy Internal Restraint System Kit (IRSKIT) Conducted at Savanna AD, 15 Sep 77.

⁴⁷ Project Management Overview for Army Container Oriented Distribution System, Jul 77.

⁴⁸ Containerized Shipment & Storage of Ammo (COSSA) Study, LOGC, Sep 76.

⁴⁹ Munitions System Support Structure (MS³) Study, LOGC, Oct 76.

⁵⁰ Authorized Stockage List (ASL) Mobility Study, LOGC, Apr 77.

⁵¹ PM Overview for Army Container Oriented Distribution Sys, Jul 77.

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Project Manager for Training Devices

(U) The Office of the US Army Project Manager for Training Devices (TRADE) was organized under a charter signed by the Secretary of the Army on 23 December 1974, and General Order Number 140, dated 14 July 1974. In the formation of PM TRADE, the Army Training Device Agency (ATDA) in Orlando, Florida, became the subordinate organization. Coincidental with the establishment of PM TRADE, TRADOC Headquarters established at Fort Benning, Georgia, a counterpart organization called Training Device Requirement Office (TRADER). TRADER was originally established at Fort Benning in order to be close to the user and to be colocated with the US Army Training Support Center (TSC) which was to have been located at Fort Benning. Based on a later decision by TRADOC, TSC was located at Fort Eustis, Virginia. PM TRADE relocated to Naval Training Equipment Center (NTEC), Orlando, Florida, and merged with ATDA on 1 September 1976.

(U) During this fiscal year, the need for training devices continued to grow. One of the major areas with increased emphasis was the armor community due to the increased development of the XM-1 Tank, the improvement of the M-60 Series of Tanks, and the establishment of the Tank Force Management Group at DA. The increases in funds provided for the support of tank crew training to include training devices strongly suggested that a real concern had been manifested at the highest levels for our ability to successfully fight and survive the armor battles that may be ahead.

(U) The emphasis given the upgrading of the tank force impacted considerably on PM TRADE. With the high priority that Armor rapidly acquired, there was a tremendous growth in the requirements generated by the user. Many training device development efforts with low priority that were underway were greatly accelerated.

(U) To provide the intensive management that Armor Training Devices development required, PM TRADE established a temporary Armor Systems Division. This division was to be the focal point within the Army for all armor related training device development and was to be responsible for non-systems as well as systems training devices.

(U) The PM TRADE was working on 29 Armor related training devices and studies, of which the major items are listed below:

- Tank Weapons Gunnery Simulation System
- Eye Safe Laser Range Finder
- Command and Control Tactical Vehicle
- Sub-Caliber Training Devices
- Main Tank Gun Weapons Effects Simulation System
- Tank Appended Crew Evaluation Device

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Armor Remoted Target System
Thermal Signature Target
Armor Training Device Technology Study
Full Crew Interaction Research Simulator
XML Training Devices (11 Devices)

(U) In 1977, PM TRADE's Aviation Systems Division initiated new programs in support of the introduction of the UH-60 BLACKHAWK Helicopter and the AH-64, Advanced Attack Helicopter. For the UH-60, the effort centered on a family of maintenance trainers to support instruction in TRACOC's schools. These nine different training devices were under contract to four manufacturers. Full scale engineering development continued on the UH-60 Flight Simulator, an element of the Synthetic Flight Training System (SFTS). The AH-64 effort began with the award of three design approach study contracts, seeking a broad range of thought on the design of the Combat Mission Simulator for the AH-64. This simulator, perhaps the most sophisticated ever undertaken by the Army, was to provide realistic stressful training for combat aircrews.

(U) In addition to the new programs initiated in 1977, deliveries were made of devices initiated earlier. Five more units of the UH-1 Flight Simulator were installed, bringing the total in service to 16. A contract was awarded for four more units, to be delivered in 1978. The prototype Flight Simulator for the CH-47 CHINOOK Helicopter was accepted and tested successfully at the Aviation Center. The prototype Flight and Weapons Simulator for the AH-1 COBRA was delivered to Fort Rucker, Alabama. A family of 18 maintenance trainers for the TOW/COBRA Weapons System was developed and delivered to Fort Eustis, Virginia. Finally, three CH-47 Maintenance Trainers were delivered to the Imperial Iranian Army Aviation Training Center.

(U) The Ground Systems Division of PM TRADE fielded three major devices in FY 1977. The Main Tank Gun Weapons Effects Signature Simulator (MTG/WESS) fielding began in April 1977 and was scheduled for completion in February 1978. This MTG/WESS provided for simulated main tank gun fire by producing a flash, bang and smoke effect. The device was mounted on the gun tube of selected M48 tanks, M60 series tanks, M551 and the XML, and held nine 50mm cartridges and was electrically activated.

(U) Two of three Day Record Fire Ranges were fielded in FY 1977 with the third range being fielded in November 1977. These three ranges were procured for installation at Fort Jackson, South Carolina. Each range featured 16 firing lanes with seven static targets per lane. These targets were controlled by an automated (computerized) control console which was capable of rapid firing table changes. The console provided a real time display of range status including the number of hits per lane, up/down time sequences, status of targets and mode of

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operation. This system also included a hard copy printer which recorded lane scoring results and, in turn, provided a permanent record of all firing activities.

(U) Six Miniature Moving Targets (MMT) were fielded in September 1977 at Fort Sill, Oklahoma. The MMT were to provide a moving target which would train forward observers in the technique of delivering indirect artillery fire on moving vehicles.

(U) The Ground Systems Division also awarded three contracts for new devices. One of these was the FIREFINDER Training Device (mortar locating radar trainer) which was awarded to Hughes Aircraft. This need existed since the development of the AN/TPQ-37 (Artillery) and AN/TPQ-36 (Mortar) locating radars prompted a materiel need for cost effective simulators to support resident training at the US Army Field Artillery School (USAFAS), Fort Sill, Oklahoma. The second was for an advance development contract awarded for the Infantry Remoted Target System which was to encompass an Engineering Development level of effort in such areas as reliability, availability and maintainability (RAM), preparation of maintenance manuals and technical data, and support of Development Testing/Operational Testing (DT/OT). It was envisioned that this accelerated schedule was to permit a small quantity Initial Production run immediately following DT/OT I and II. A letter contract for full scale production was awarded in September 1977 to US Armament Corporation on the Conversion Kit (M261) which consisted of a bolt adapter assembly and three magazines. This kit allowed caliber .22 LR ammunition to be fired through M16A1 rifles thus saving .06 cents per round during basic rifle marksmanship training.

(U) Another pertinent milestone was achieved with the delivery of two Observed Fire Trainer Prototypes for DT/OT II test at Fort Sill. This trainer was an electro-mechanical, computer driven device which, through an advanced series of optical units interfaced with sound systems, projected a high resolution terrain scene upon a screen as well as over-projections of bursts from artillery/mortar weapons throughout the breadth and depth of the scene depicted. Following standard procedures, an observer may request and adjust simulated artillery/mortar fires upon a variety of targets inserted into the terrain scene. A computer programmed in artilleryman's language was used corresponding to the data (accurately surveyed) throughout the breadth and depth of the terrain scene along with a series of bursts appropriate in size and smoke to 81mm and 4.2 inch mortars, 105mm howitzers, 155mm howitzers, 175mm guns and 8 inch howitzers. Through an instructor's console, the bursts may be positioned throughout the terrain scene simply by providing the location required either by coordinates, polar plot, or shift from a known point.

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(U) The Multiple Integrated Laser Engagement System (MILES) was in the 21st month of development. MILES was a family of direct fire simulators consisting of both laser transmitter (weapon) and receiver (target). MILES was to permit units and weapon systems to maneuver against each other, delivering their simulated destruction with a real-time hit and near miss assessment and to provide the realism previously lacking in field training. At present, the MILES system was on schedule with DT/OT II scheduled for the 4th Quarter of FY 1978. An addition to the MILES program last year was the Anti Tank Weapons Signature Simulator (ATWESS). This device was to operate in the TOW, VIPER and DRAGON Anti Tank Weapons and utilize a common blank round to produce the desired signature.

(U) Initial basic R&D funding was to be provided in FY 1978 to study Air Defense Simulation (ADS) and Air to Ground engagement simulation concepts for integration into engagement simulation family of training devices. Future growth areas included indirect fire, anti-personnel and anti-tank mines, high performance aircraft, energy and simulated operations in the Nuclear, Biological and Chemical environment. A .50 cal Blank Fire Attachment (BFA) for the M2 machine guns was being developed for use with the other MILES devices, and a BFA for the M85 was programmed for next year. There was a product improved blank round of ammunition being developed to operate in the M2 and M85. The Combat Vehicle Kill Indicator - Pyrotechnic Device (CVKI-PD) was also being developed for use with the MILES devices, and was to be activated to show that a vehicle (i.e. tank, APC) had been hit by producing an outflow of smoke for approximately 15-20 minutes to reflect a simulated destruction.

(U) Cost estimating across all product lines was perhaps the most visible support with baseline cost estimates for the IRETS and MILES programs being examples of the more extensive cost estimating activities. An economic analysis of the benefits of using the 2B38 Flight Simulator in place of actual flying hours on the BLACKHAWK Helicopter was completed and received recognition at the DOD level as a model of other services to use in conducting similar analyses.

(U) The form and structure of the PM TRADE exploratory development program began to emerge. Emphasis was placed on managing the training device technology base in terms of five technology areas: engagement simulation, visual simulation, electronic simulation, maintenance simulation, and electro-mechanical simulation. Through participation in the Joint Technology Coordinating Group (JTCCG) for Training Technology and through working in association with the Naval Training Equipment Center in providing inputs for Technology Coordinating Paper: Training and Personnel Technology, prepared for the Office of the Director of Defense Research and Engineering, the program contained in the five technology areas was structured to support continuing technology needs for the Army training devices while being at the same time coordinated with activities in other Services to avoid overlap and redundancy.

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(U) The Logistics Management Division further emphasized and strengthened Integrated Logistics Support Planning through realignment of spaces to provide an increased capability in this critical area. Spaces were converted from field support functions through increased tasking of Naval Training Equipment Center and expansion of Inter-service Support Agreement with Tobyhanna Army Depot.

(U) Integrated Logistics Support Plans were completed for all ongoing programs. Also, Materiel Fielding Plans were prepared for Artillery Direct Fire Trainer, Weapons Effect Signature Simulator (WESS), TOW/COBRA Part Task Trainers and Conversion Kit 5.56mm.

(U) In 1977, PM TRADE's Instructional Systems Division initiated new programs in support of the Army's Training Extension Course (TEC) programs. Three contracts for a total of 600 new TEC lessons were awarded in May 1977. In addition, other contracts were also awarded.

(U) Three contracts were awarded for the design, development, and reproduction of 600 TEC lessons in support of the following schools: Armor, Infantry, Signal, Aviation, Administration, Academy of Health Sciences, Intelligence, Military Policy, Field Artillery, Chaplain, Ordnance, Engineers, Quartermaster, and Transportation.

(U) A fixed price contract was awarded to provide total MOS analysis and design, along with the development of Master Training Kits, Training Management Kits, and Production Training Kits. It was estimated that approximately 100 Master Training Kits were to be developed for MOS 72E, Telecommunications Specialist, in support of the Signal School.

(U) Two TEC fixed price reproduction contracts were awarded for reproduction of audio-visual and audio-only lessons. These contracts were to provide the reproduction capability for known and anticipated requirements.

(U) Instructional Systems Division continued to provide contract administration and management support for the TEC and related programs during the past year. The outlook for FY 1978 was to include requirements similar to the FY 1977 requirements as well as expansion of the total job training requirements. In addition, the Instructional Systems Division was to become more active in the area of Integrated Technical Documentation and Training.

(U) With the trend toward training devices and the variety and complexity of these projects, together with increasing demand for large quantities of devices, it became evident that intensive management was required. To this extent, PM TRADE recommended to DARCOM the establishment of four Product Managers, thus releasing the Project Manager from the management interfacing details. The four Project Managers were for Aviation Training Devices, Armor Training

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Devices, Engagement Simulation Systems, and Instructional Systems.

(U) PM TRADE successfully accomplished its mission in the overall management of non-systems training devices as well as providing direct management of in-house projects, monitorship of projects delegated to other commodity commands and assistance rendered to other Project Managers in support of training devices for their systems in FY 1977. The FY 1978 RDTE program was subjected to severe reductions. From an initial program of \$24.7 million, sustained cuts brought it to a present level of \$18.5 million. This reduction effectively terminated all new developmental efforts and caused stretch out of some ongoing programs. Without some relief, there would not be any new training device development tasks initiated in FY 1978. In addition to the funding problem, the office also experienced a personnel crunch. With the increased workload in such areas as armor (XM1, M60), there was a need for additional spaces. These were identified in the Summer of 1977 with a request to DARCOM for an additional 57 positions. This was answered with an increase in ceiling of five positions.

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CHAPTER X

BATTLEFIELD SYSTEMS INTEGRATION

Background

Mission

(U) The DARCOM Directorate for Battlefield Systems Integration (BSI) is a relatively new organization, becoming operational only in August 1975.¹ The product of ASA (R&D), DARCOM, and TRADOC discussion, the directorate was responsible for the creation of that interdisciplinary design necessary to make the field Army a total and cohesive combat system, a system integrated in such a way that the maximum total system capabilities were drawn out of combat systems such as ground forces, organic aerial units, and appropriate components of the Tactical Air Force.² This task involved several duties, paramount of which were the consideration of current and projected threat doctrines, equipments, organizations, and tactics; the application of the elements of current and projected US doctrine, equipment, organization, tactics, and environmental effects to construct a realistic battlefield, or Battlefield Architecture; the examination and test of current and projected battlefield architectures to determine their respective capabilities to meet threats; and the identification of not only the problems discovered by such examinations and tests, but also their solutions, whether in technology, analytical effort, or intelligence data.³

Personnel

(U) To help the directorate meet these responsibilities, the director had a twenty-man work force. It consisted of his deputy, a GS-17 civilian; nine Colonel Systems Directors; six civilian staff analysts (GS 15-16's); and four secretary/stenographers (GS 9, 8, and 5). The director believed this force inadequate; he sought to elevate the two GS-5's to 6's and to add two GS-5's, one E-5, one GS-14 for Procurement, and one GS-12 or 13 Budget Analyst.⁴

¹HQ DARCOM Annual Report of Major Activities, FY 76/77, p. 257.

²BSI, Job Description, Director of Battlefield Systems Integration, 8 Sep 77.

³BSI, Fact Sheet, 14 Jul 76, Subj: Justification for Restoration of Battlefield System Integration Directorate Funding - FY 1979.

⁴BSI, Fact Sheet, 18 Sep 77, Subj: TDA Allowances.

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Management

(U) Whatever the composition of his workforce, the director faced a formidable management subject: combat subsystems. He had to determine which of these subsystems offered the best potential for an increase in combat power. The subsystems were highly varied, ranging, for example, from fire support to armored warfare night combat operations, and they had to be considered within several planes, such as weapons, mobility, command and control, and combat support.

(U) Once the director settled upon a subsystem, he was able to choose two approaches. First, he could, with DA approval, if necessary, form a study team consisting of directorate personnel and technical representatives from other elements of the Command and from TRADOC. Or, if he deemed a simpler tack better, he could use his own staff to pursue a detailed analysis with, if needed, support from the Command or from a contractor. The result of either approach was an advanced combat system concept forwarded, if appropriate, to the DA for review and approval. The director then used the result to recommend one of two courses to the Deputy Commanding General for Materiel Acquisition: either initiate prototype demonstrations or materiel development to achieve an integrated combat system, or terminate a program.

(U) Cooperation was the essential element in directorate success. This meant, in general, a widespread coordination with materiel and combat development activities in the Army, other services, and allies. It meant, in particular, coordination with RD&E on the status of R&D programs and requirements; direct contact with the commodity commands and development centers on materiel developments, evolving technology, and new hardware fielding; and continuous contacts with the TRADOC on doctrine, with the FORSCOM on user problems, with the other services on common requirements, and with the Foreign Science and Technology Center (FSTC) and allied powers on foreign technology developments and standardization.⁵

(U) Management of the BSI, in summary, involved acting as an integrating office for similar battlefield systems in order to obtain maximum efficiency from these systems. In this role, the BSI had to act in close coordination with other DARCOM elements and especially with the TRADOC. The primary aim was to channel the proper technology to the TRADOC and ultimately to the battlefield.⁶

⁵BSI, Job Description, op. cit., pp. 2-3.

⁶MFR, BG W.B. Burdeshaw, Ass't Div Cmdr, 1st Cav Div, Ft. Hood, TX, 2 Jun 77, Subj: Battlefield Systems Integration (BSI) Office. For further on BSI's introduction, see ltr, Hon Charles L. Poor, Dep ASA (R&D) to Hon Howard H. Calloway, SA, 31 Dec 74, Subj: Integrated System Design Agency, w l/incl, "The Army and 20th Century Technology."

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Funding

(U) In FY 1977, BSI received \$4.5 million in funds of \$5 million requested. The BSI spent the bulk of these funds on administration and research - about \$3.01 million, or 60 percent. About \$1.99 million, or 40 percent, went to the Mitrek Division of the Mitre Corporation, located in McLean, VA.⁷

(U) The BSI underwent stringent budget cuts in FY 1978 - from \$7 million asked to \$3.641 million in final program authority,⁸ and it faced a more severe FY 1979 reduction. The House Armed Services Committee (HASC) started by reducing the FY 1979 figures to \$5 million, to be followed by a Senate Armed Services Committee (SASC) decrease to \$3 million, the latter based upon the justification that the BSI had unsuccessfully attempted to build large-scale computer models.

(U) The BSI countered. First, it explained that it had not tried to build large scale models; on the contrary, it had succeeded in developing a technique that would take the output of models and simulations and incorporate this output into its relative effectiveness analysis. Second, the BSI noted that it had constructed a life cycle cost model that was uniquely helpful in the materiel acquisition process. The BSI concluded that it needed its full \$7 million for FY 1979 in order to complete its formulation and field verification of a battlefield systems architecture. A reduction to \$5 million would preclude field verification and force the BSI to focus on emerging an unpredictable problem. The \$3 million budget would overturn the battlefield architecture entirely, thus perpetuating subjective materiel acquisition decision-making.⁹

Accomplishments

General

(U) For the funding which it had received, the BSI had attacked an impressive range of targets and had scored achievements in each of these. It had defined the systems and performed doctrine and threat analysis in aviation and tactical nuclear warfare. It had analyzed the missions and defined the threats in enemy air defense suppression

⁷The total fund figure is from: (1) COL Cornelius J. Gearin, Jr., Actg Dir, BSI, Fact Sheet, 2 Jun 78, Subj: Justification for Partial Restoration of Battlefield Systems Integration Funding for FY 1979. The Mitrek figures are composited from: (2) MITRE Monthly Activities Reports, Oct 76-Sep 77.

⁸COL Gearin, Fact Sheet, op. cit.

⁹COL Cornelius J. Gearin, Jr., Actg Dir, BSI, Fact Sheet, 12 Jul 78, Subj: Justification for Restoration of Battlefield Systems Integration Directorate FY 79 Funding.

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and intelligence and surveillance. It had identified the threat in EW and air defense, as well as defining the current systems and doctrine in the latter. It had defined the systems and doctrine in tactical communications and close combat support systems, including developing the threat for the latter. Finally, it had evaluated the Army Forward Ammunition Supply Systems and had recommended changes; had developed the architectural evaluation tools for campaign analysis; and had analyzed the mission area and campaign aspects of fire support systems for the integration of technological opportunities into new or current systems.¹⁰

Particular - Contractual

(U) As aforementioned, approximately 40 percent of the BSI's funding went to secure the services of the Mitre Corporation. Among the corporation's major efforts were, by interest area:

(U) Architecture. The Intelligence, Surveillance, and Target Acquisition (ISTA) Mission Area Review was aimed at a thorough state-of-knowledge review of the ISTA mission area in order to assess the Army's present and future battlefield capabilities and to identify key issues and technological capabilities. This review entailed two steps. First, the corporation had to explore the battlefield applications of such concepts as the Stand-Off Target Acquisition/Attack System (SOTAS) and the potential contribution of ISTA to near-real-time maneuver control at brigade and battalion levels. Second, using conclusions drawn from step one, the corporation derived ISTA's gross system design parameters and alternative system design concepts by conducting functional analyses of eight tactical action areas and synthesizing the analyses' results. The eight areas included maneuver control, enemy air defense and artillery suppression, and the determination of enemy main threats and plan of attack.

(U) On 21 January 1977, the corporation delivered what was essentially a final report to the BSI. The report discussed the key studies, ISTA organizations, EW systems, the European environment and threat, and ISTA's current status. Special features included the development of an integrated sensor wide-area surveillance capability, the refinements of the requirements for, and design characteristics of, a precise communications emitter location system (ELS), the development of EW concepts, and the relation of ISTA data to tactical actions. The report, with the last of eight supplements, appeared in April.¹¹

¹⁰BSI, Past BSI Effort, Jul 78.

¹¹MITRE, op. cit., Oct 76- Apr 77.

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(U) Much as the ISTA effort, the Reconnaissance, Surveillance and Target Acquisition Functional Area (RSTA) project was a state-of-knowledge review of the Army's present and future battlefield capabilities in the RSTA area, done in order to identify key issues and technological opportunities. With the participation of Advanced Research Projects Agency (ARPA), the Lincoln Laboratory, and other agencies and contractors, the corporation investigated an integrated radar concept; considered both the Air Force's Multilateration Strike System (MRSS) and the UPD-4 Synthetic Aperture Radar (SAR), as well as the AN/PPS-5 Radar; developed a Radar Comparison Matrix showing the commonality potential in several radar subsystems for the PPS-5, FAAR, TPS-58/MTAR and TPQ-36 Radars; and prepared a special position paper on ground surveillance radars (GSR). On 3 January 1977, the corporation sent a RSTA draft report to the BSI. Among its main recommendations were a modification of the PPS-5 Radar, an integration of the Lincoln Laboratory's new radar development with another proposed radar development, and an initiation of a requirement for multiple sensor technologies and a moving target classification system.¹²

(U) Technology Base. The corporation followed a more general approach in the technology base sphere, its intents being no less than an assessment of the Army's technological base activities in regard to future operational needs and an identification of new R&D initiatives for substantially improving the Army's combat capabilities. The result was a thorough investigation of the Army's technology base in Watertown, Mississippi, an investigation that focused upon activity interest in close combat and fire support, especially artillery attrition. The corporation, however, was unable to go beyond a preliminary analysis of technology base efforts in most mission areas because of the lack of a comprehensive and reliable data base.

(U) Nevertheless, the corporation did complete an analysis of technology base R&D work units by topic area of relevance to the RSTA mission. It then correlated the results with known RSTA problems. It was thus able to identify some particularly important areas of relative technological activity as, for example, the response to the surface-to-air missile (SAM) threat to RSTA airborne assets.¹³

(U) Division/Corps Command and Control. There were three main division/corps command and control actions. These three, and their goals, were Corps/Division Operations, which was an attempt to develop design concepts for tactical level information fusion centers at division and corps levels; Target Acquisition and Control System (TACS),

¹²MITRE, op. cit., Oct 76-Mar 77.

¹³MITRE, op. cit., Oct 76-Feb 77.

[REDACTED]

which tried to develop a system concept for integrating the flow of information within a corps and its divisions; and Division and Corps Testbeds, which was to assess current Army command and control testbed capabilities, plans and needs, and to identify and examine alternatives for developing future testbeds. Results included, as examples, a BSI-OASD (Intelligence) study on the establishment of procedures and criteria for the selection of tactical targets and a revision of a proposed technical interface concept (TIC) document for the integrated flow of information within the total corps structure.¹⁴

(U) Begun in January 1977, the purpose of the Suppression of Enemy Air Defenses (SEAD) Task was to review the Army's SEAD needs and the status of SEAD activities, to determine the proper elements of a comprehensive Army SEAD program, and to develop a plan for achieving this program. After preliminary data collection, SEAD turned to address those problems, issues and actions of immediate concern. By April, the contractor was able to present a fairly detailed SEAD briefing, to include a threat summary, a review of current and projected programs and studies, and an assessment of main Army needs.

(U) The director received his initial 9 June 1977 briefing favorably, requesting a priority approach to the questions of the use of remotely piloted vehicles (RPV) with jammers and cruise missiles in a SEAD role. The cruise missile issue rated a separate look, while the RPV-jammer answer took the form of an operational concept paper. The contractor also modified the Stochastic Combat Model (STOCOM) for SEAD application, determined the need for the development of small-scale, set-on frequency tracking receivers, analyzed the use of artillery for SEAD, and initiated investigations on the effectiveness of alternative aircraft tactics in the presence of certain enemy air defense systems.¹⁵

Particular - In-House

(U) All of the aforementioned contractual projects served to complement the BSI's own efforts which covered a considerable area. Some of these effort areas included:

(C) Anti-Armor Systems. In January 1977, the BSI decided to convene a 9 March 1977 anti-armor conference at the HQ DARCOM. There were two reasons for this BSI decision. First, the BSI believed

¹⁴MITRE, op. cit., Oct-Dec 76.

¹⁵MITRE, Op. Cit., Jan-Sep 77.

that it was necessary to consider alternatives to TOW for the defeat of Warsaw Pact armor in a non-nuclear fight. Second, the BSI had to consider funding constraints.

(U) The conference was to have three basic objectives. It was to assess the threat, to determine what present, planned and future systems could do about the threat, and finally, to determine whether to seek an Army Scientific Advisory Panel study of the materiel acquisition of anti-armor systems.¹⁶

(U) On 17 March 1977, just after the BSI conference, the TRADOC hosted its own anti-armor conference. This conference was to discuss the status of anti-armor technology and two Letters of Agreement (LOA). One LOA was for a TOW modification; the other was for a TOW alternative.

(C) The TOW modification got the most attention. The paramount question here was the procurement of a solid state track link (SSTL) modification kit for the TOW,¹⁷ a kit that would cost \$150 million if used to "harden" all TOW trackers and half of the TOW missiles. The BSI, however, discovered that the kit had several flaws: it was not compatible with the TOW night sight, it did improve the TOW's accuracy; and it could be undone by a wide-angle, high-intensity pulsed light source (WHIPS); i.e., a Xemen searchlight mounted on a tank. Accordingly, with the cost and with these limitations in mind, the BSI recommended non-procurement of the kit. The BSI, instead, took note of the Commander, TRADOC's strong interest in a TOW modification that would harmonize the tracker and night sight and defeat WHIPS.¹⁸ The Commander, DARCOM, however, opted for a procurement recommendation.¹⁹

(U) Another anti-armor candidate was the 75mm Cannon, otherwise known as a medium caliber automatic anti-armor cannon (MC-AAAC). In April 1977, at the TRADOC's behest, the BSI studied the feasibility of advanced development for the MC-AAAC. The results of the study were mixed; the cannon was found to have great potential, but it was not determined whether the 75mm was the optimum caliber, what its tactical and optimum applications were, and what the costs of its

¹⁶Msg, DRCBSI, HQ DARCOM, to Cdr, TRADOC et al., 11 Feb 77, Subj: Anti-Armor Systems Conference.

¹⁷Ltr, LTG George Sammet, Jr., Cdr, DARCOM, to CSA, 19 Mar 77, Subj: TOW Missile Modifications.

¹⁸COL Cornelius J. Gearin, Inf Sys Dir, BSI, Fact Sheet, 5 Apr 77, Subj: Solid State Track Link (SSTL) Mod of the TOW Missile System.

¹⁹Msg, GEN John R. Guthrie, Cdr DARCOM to GEN Donn A. Starry, Cdr TRADOC et al, 16 Sep 77, Subj: TOW Solid State Track Link (SAB).

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development were. Accordingly, the BSI called its advanced development a premature step.²⁰

(U) Division Real Time Application Specification (DIVRAS). DIVRAS was a cooperative program among the BSI, the Combined Arms Center Development Activity (CACDA) of the TRADOC, and IBM. DIVRAS was a command and control system that featured semi-automatic sensor interfaces and modern compact software and graphics. Began in February 1977,²¹ DIVRAS had evolved by July 1977 into an experimental test bed designed to improve those divisional command and control procedures used in the real time application of weapons systems and the rapid maneuver of forces.

(U) DIVRAS had two operational keys. One was the large amount of combat information inputs from command and subordinate battlefield sources, the other the use of computers. When working properly, DIVRAS was to enable the division to direct its fires and move its men, the latter with graphic displays. The VCSA was sufficiently pleased to order a modified DIVRAS experimental test bed to be used in the FRG for REFORGER 79.²²

(U) Tactical Echelon Fusion Centers. DIVRAS also acted as one segment of a proposed automated tactical echelon fusion center. Such a center was a tactical facility in which sensor-gathered intelligence and target acquisition reports combined to form an integrated intelligence picture. As of mid-1977, such centers were in the Army at division and corps levels, but on a manual processing basis. With the flood of data from new sensors, manual processing became ineffective, a situation which produced a DDR&E memorandum to have the Army and Air Force join forces to establish a single fusion center. The memoranda did produce a meeting, but both services balked at the idea of one center in place of centers at the tactical level. Instead, they wanted to continue their own efforts to develop automated fusion centers, of which DIVRAS constituted the division portion.²³

(U) The DDR&E, however, disregarded the services' objections, directing them to establish a fusion center experimentation facility to use in validating computer-assisted operational concepts and in

²⁰Msg, DRCBSI, to ATCD-CM/A, HQ TRADOC, 25 Apr 77, Subj: 75mm Cannon.

²¹Ltr, MG Ira A. Hunt, Jr., Dir BSI, to GEN Walter T. Kerwin, Jr., VCSA, 29 Jun 77, Subj: DIVRAS.

²²COL Wilmot, BSI, Fact Sheet, 27 Sep 77, to Comp DARCOM, Subj: DIVRAS.

²³COL Joseph Ganahl, Arty Sys Dir, BSI, to CG DARCOM, Fact Sheet, 16 Jun 77, Subj: Tactical Echelon Fusion Centers.

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developing procedures for integrating sensor inputs. The vehicle was a BETA Joint Project Office (JPO), the guidance of which was to be given by a BETA Steering Committee. Chaired by the Air Force, the committee held its first meeting on 27 September 1977.²⁴

(U) The BETA JPO had direct BSI influence. Dr. Philip C. Dickinson of the BSI became the BETA JPO Director, to report directly to the steering committee. The JPO was to begin operations on 3 October 1977 at the Harry Diamond Laboratories (HDL), with DDR&E charter approval to follow on 1 November. Although BETA was to operate on an accelerated basis to integrate into the NATO C³ structure, the BSI did not believe it could be easily accommodated in a test bed status for REFORGER 80, as anticipated.²⁵

(U) C³I. On 24 May 1977, DA informed DARCOM that it should direct attention to the proper organization of command and control communications and intelligence (C³I). Based upon Army Scientific Advisory Panel (ASAP) recommendations for the establishment of a strong command and control systems architecture and systems engineering capability, the DA directive offered two guidelines. One was a need to take an overall view of combat forces to ensure that those systems defined in individual ROC's, such as TACFIRE and SOTAS, could be formed into ". . . a reasonably effective Corps system." The second was an assurance that reliable, secure communication systems offered ". . . full interoperability through careful systems engineering."²⁶

(U) The DA letter prompted users and developers to initiate the establishment of system architecture and system engineering disciplines. On 14 September 1977, under BSI auspices, the key senior officers involved in this effort were called to meet.²⁷ The meeting followed on 29 September 1977 with DARCOM, DA, TRADOC, and CSC representatives in attendance. LTC H. H. Cooksey, HQDA, chaired the meeting, which culminated in suggestions for the improvement of the Army's C³I System Architecture and Engineering.²⁸

²⁴Msg, DRCBSI, HQ DARCOM, to AEAGC-O-C3, CINCUSAREUR, 30 Sep 77, Subj: BETA Project.

²⁵Ltr, Philip C. Dickinson, Actg Dir, Proj BETA, to DDR&E, HQDA, 29 Sep 77, Subj: BETA Project Status Report #1.

²⁶Ltr, LTG Howard H. Cooksey, Dep CS for Res, Dev, & Acquisition, HQ DA, to Cdr, DARCOM, 29 May 77, Subj: Command and Control Communications and Intelligence Systems Engineering.

²⁷Ltr, MG Ira A. Hunt, Jr., Dir BSI, to MG William I. Rolya, CG, US Army Intel Sec Cmd, Arlington, VA, 14 Sep 77, same subj.

²⁸BSI, 30 Sep 77, Subj: Army C³I System Architecture Meeting, 29 Sep 77.

(C) Air Defense. By January 1977, the Director, BSI, had grown quite concerned about an air defense (missile) gap. The cause of the gap was the Hind, a Soviet helicopter which could fire missiles from stand-off ranges with impunity against the deployed air defense (DIVAD) gun, the STINGER, the ROLAND, and in many instances, the HAWK. The Director believed that a potential gap-plugger existed, taking the form of two contractors - General Dynamics and Aeronutronics-Ford-DIVAD guns. The Director believed that a minor modification to these developing guns could result in the only available capability for incoming missile defense in the near future.²⁹

(U) In the following month, February 1977, another DIVAD candidate appeared. At that time, the Secretary of Defense (SECDEF) directed the Secretary of the Army (SA) to evaluate the GEPARD air defense gun as an alternative to DIVAD. By June 1977, the SECDEF directive had produced a proposed ASA (RDA) visit to the FRG with an Army team.³⁰ The purpose was to discuss a possible GEPARD buy.³¹

(U) On 22 July 1977, the US team received briefings on both the GEPARD and its potential U.S. competitor. The German gun was already available for testing, while the U.S. gun program had yet to pass its Source Selection Evaluation Board (SSEB). The US team, therefore, set 15 October 1977 as a final date for recommendations.³²

(U) On 25-29 July 1977, the team visited Germany. The team found that although the GEPARD had adequate training and maintenance equipment, it tracked slowly and had potential cost and subcontractor contracting problems. The Germans insisted that the GEPARD was being improved, that it could put 188 guns into U.S. hands by August 1980, and that, without the GEPARD, which was now in Dutch, Belgian, and German hands, the U.S. sector by 1980 "... would present a soft underbelly to Warsaw Pact air intrusion."³³ Despite the German's stand, the Director recommended continued DIVAD development to give the U.S. a choice.

²⁹Ltr, MG Ira A. Hunt, Jr., Dir, BSI, to MG Robert J. Turner, Commandant, US Army Air Def Schl, Fort Bliss, TX, 26 Jan 77, Subj: DIVAD.

³⁰MG Ira A. Hunt, Jr., Dir, BSI, to Cdr, DARGOM, Fact Sheet, 15 Jul 77, Subj: GEPARD Discussions with FRG.

³¹DF, MG Ira A. Hunt, Jr., Dir, BSI, to Cdr DARGOM, 20 Jul 77, Subj: US-FRG GEPARD Planning Conference.

³²COL Cornelius J. Gearin, Sec., US Team, MFR, 22 Jul 77, Subj: GEPARD Air Defense Gun Team Meeting.

³³Memo, MG Ira A. Hunt, Jr., Dir, BSI, to GEN Howard Cooksey, 3 Aug 77, Subj: Trip Report, Germany, 25-29 July 1977.

(U) Army Ammunition Repackaging and Supply. On 24 March 1977, the DA supplied the impetus for this action, assigning to the DARCOM the overall responsibility to develop an integrated concept for packaging, shipping, storing, handling, forward resupply, and servicing of weapons with ammunition. DA guidelines included the address of near and long term improvements, the focus upon field artillery, armor and infantry weapons, and the consideration of such factors as complete deliveries, shipment packaging size and weight reductions, palletization, containerization, and increased transportability. The DA wanted a recommended concept by mid-July 1977.³⁴

(U) To meet the DA's directive, the BSI assembled an Ammunition Initiatives Task Force (AITF). This force consisted of representatives from the TRADOC, the Army Materiel Systems Analysis Activity (AMSAA), the Human Engineering Laboratories (HEL), and those DARCOM R&D and readiness activities involved with ammunition. On 1 April 1977, the BSI established a methodology and assigned responsibilities; the TRADOC, for example, was to confirm ammunition rates and requirements.³⁵ The AITF's goals were to describe the ammunition supply and resupply system supporting field artillery, armor, and infantry weapons, to analyze the strengths and weaknesses of the system, to recommend specific improvements to the system, and to recommend program actions and funding for the weapons for FY 1979-1983.³⁶ The AITF was to begin by meeting at the Defense Systems Management College (DSMC), Fort Belvoir, VA, 18-22 April 1977, then to reassemble at the same place on 2 May to effect a 20 May first concept target date.³⁷

(U) By 2 May 1977, the AITF had made much headway. Areas of progress included definition of a baseline system and identification of the essential elements of analysis, system deficiencies, and potential solutions. Accordingly, the Director, BSI, called for a 1 June 1977 general officer review of the AITF draft concept at the DSMC.³⁸ The

³⁴Msg, DRCBSI, to Cdr ARRCOM, 29 Mar 77, Subj: Army Ammunition Packaging and Resupply.

³⁵Msg, DRCBSI, to DRSAR-AS, HQ ARRCOM, 5 Apr 77, Subj: Ammunition Initiatives Task Force.

³⁶Philip C. Dickinson, Actg Dir, BSI, to Dep Cmdg Gen for Mat'l Readiness, Fact Sheet, 8 Apr 77, Subj: Initiatives in Ammunition Supply and Resupply.

³⁷Msg, DRCBSI, to Cdr MIRADCOM and Cdr MIRCOC, Huntsville, AL, 5 Apr 77, Subj: Ammunition Initiatives Task Force.

³⁸Msg, MG I. A. Hunt, Jr., Dir, BSI, to MG V. Lewis, 2 May 77, Subj: General Officer Review, Ammunition Initiatives Task Force (AITF).

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general officers included three HQDA officers: BG Canedy, DCSOPS, MG Malley, DCSRDA, and MG Thompson, DCSLOG. Comments and suggestions were to be solicited, especially about such matters as rearming maneuver elements, to include helicopters, in combat. The solicitations, in turn, were to help shape recommendations to the VCSA in mid-July.³⁹

(U) The recommendations, however, were not made until 20 August 1977. General Kerwin was very pleased, especially with such recommendations as those for more attention to resupply in the early R&D phases of weapon and ammunition systems development and the use of helicopter ammunition lifts in forward areas. General Kerwin felt that the AITF touched an extremely important subject area, and he therefore directed the DCSOPS to pursue the recommendations by preparing a management plan - a systematic plan, too, not a "hasty, half-assed" job.⁴⁰

(U) Other BSI Actions. In addition to these major projects, the BSI acted in a host of highly significant areas. Some included:

Ground Surveillance Radar. In order to accelerate the development of a new generation ground surveillance radar (GSR), the BSI drafted a GSR ROC. Designed to replace the present PPS-5, TPS-25, and TPS-58 targeting radar family, the new GSR was to offer mobility and protection by its location within an armored vehicle. Other features were to be a target classification capability, as X-Y readout, and TACFIRE compatibility. The BSI intended to insure that this GSR would interface with such conceptual C² systems as DIVRAS and BETA.⁴¹

Air Defense Analysis. In order to identify air defense gaps and direct future air defense developments, the BSI began conducting an analysis of the family of air defense studies. By coupling this analysis with senior official reviews, the BSI was able to support the on-going TSQ-73, PATRIOT, STINGER, and DIVADS Gun developments, to recommend continued I-HAWK product improvements, and to call for exploitation of the DIVADS Gun against air-launched missiles. The BSI intended to follow this analysis with the development of a plan for the fabrication of air sensor nets for air defense artillery by the early 1980's.⁴²

³⁹Msg, MG I.A. Hunt, Jr., Dir, BSI to Dir, AMSAA, and Dir, HEL, APG, 3 May 77, Subj: Ammunition Initiatives Task Force.

⁴⁰Memo, MG I.A. Hunt, Jr, Dir, BSI, to Cdr DARCOM, 15 Sep 77, Subj: Ammunition Initiatives Task Force Briefing to Vice Chief of Staff.

⁴¹LTC Coburn, BSI, to Comptr, Fact Sheet, 20 Sep 77, Subj: Ground Surveillance Radar.

⁴²LTC Coburn, BSI, to Comptr, Fact Sheet, 20 Sep 77, Subj: Air Defense.

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Combat Modeling. As combat modeling had soon proven itself as an essential device for BSI syntheses, the BSI had set out from its onset to construct several measures of the relative effectiveness of weapons in close combat. By the end of FY 1977, these BSI modeling efforts had resulted in data bases built of results from the Army's principal combat models and in the methodology and software needed to play games with the models. The BSI expected the games to start in the 1st Qtr FY 1978.⁴³

Base Technology Program. As a background to the MITRE Corporation's Watertown investigations, discussed earlier, the BSI had engaged in a detailed cataloging of all of the DARCOM's Base Technology Programs. The BSI used its findings to assess the contributions made to battle-field architecture by technology. It also, as a corollary, identified gaps and trade-offs via the SPIDER CHART method, a method which graphically identified the relationships of current technology and priority requirements.

(U) In sum, SPIDER CHARTS were to provide the DARCOM and the TRADOC with a means of stimulating the input of user needs to technological developments. This entailed "prioritizing" requirements by identifying gaps and promoting user-developer dialogue. The first SPIDER CHARTS appeared in January 1977, with a final FY 1978 and FY 1979 edition planned for October 1977 publication.⁴⁴

Conclusion

(U) The BSI had begun its first full fiscal year of operations with a rather large mandate, which was no less than the reshaping of the field Army, together with its tactical air support, into a total and cohesive combat system. The necessary sequitur, the determination of the potential of all current and proposed combat systems, offered a potentially staggering challenge, if only from the high number of U.S. and foreign combat equipment alternatives. Despite the challenge, the BSI attacked on the same broad front that characterized the intentional parallelism between its organization and Army mission areas. While the results in some of these areas were still inconclusive, if promising, the BSI could note with satisfaction that many of its projects, particularly the AITF, had drawn praise from the DA. The BSI hoped that favorable funding would enable it to fulfill its programs for FY 1978 and FY 1979.

⁴³LTC Coburn, BSI, to Comptr, Fact Sheet, 20 Sep 77, Subj: Combat Modeling.

⁴⁴LTC Coburn, BSI, to Comptr, Fact Sheet, 20 Sep 77, Subj: Base Technology Program.

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CHAPTER XI

HIGHLIGHTS AND TRENDS

(U) Fiscal year 1977 could be characterized as a period of pluses and minuses. Significant accomplishments were achieved in the areas of personnel management, materiel management, procurement and production, international logistics, financial management, quality assurance, and plans and doctrine. Of major concern to DARCOM was its personnel.

(U) New personnel management programs were implemented for the military and the civilian workforce. Included were the Materiel Acquisition and Readiness Executive Development (MARED) Program for the civilian careerists and the Logistics Officer Development program for the military logisticians.

(U) Continued success was noted in the development of certain systems. With the selection of the Chrysler prototype tank system, the XM1 tank development program entered full scale engineering development. The advanced attack helicopter (AAH) completed the competitive prototype phases of the program, and began full scale development. Also, the utility tactical transport aircraft system (UTTAS) entered initial production with the award of a fixed price incentive contract to the Sikorsky Aircraft Company. After successfully passing the critical ASARC III and preceding reviews of engineering development, test and evaluation, the M198 155mm Howitzer was type classified standard.

(U) Notable achievements and trends of DARCOM in FY 1977 are highlighted below.

Personnel Management

(U) In order to provide centralized direction and control of the most important programs, DARCOM undertook to insure that qualified officers were available to serve as project managers, and to fill other top positions in the acquisition field.¹ Major programs in this area involved project manager development and training with industry.

(U) The project manager development program was designed to provide officers with wide range of experience necessary to occupy

¹ARMY, "No Weak Links in the Readiness Chain," by General John R. Guthrie, October 1977.

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top positions. Program participants were given responsible positions in PM offices and laboratories, and received advanced training at civilian and military schools. Approximately 30 officers in the training-with-industry program spent a year with an industrial enterprise learning how their civilian counterparts operated.

(U) Increased emphasis was given to the use of lieutenant colonels as product managers. A product manager was given authority and responsibility for centralized management of a program not designated major by the Army, or the concept that was being conducted but still required some degree of centralized management after termination of project management status. Candidates for these jobs were chosen from within the project manager development program. The experience these officers received was thought to improve their quality and effectiveness as project officers when they became colonels.

(U) Several Army career and executive development programs were in existence to accommodate civilians who comprised 90 percent of the DARCOM work force. To develop a select group of high-level careerists cross-trained in the various functional areas, DARCOM continued to implement the materiel acquisition and readiness executive-development program (MARED) which was originally developed in January 1976.

(U) MARED participants, through formal and on-the-job-training programs, were given the broad experience and perspective needed for high-level management. Nominees for the program were subjected to highly competitive evaluation and were selected by a board of headquarters executives. The promotions and reassignments of these individuals point to the success of the program. Its real value, however, will become evident when these highly trained and widely experienced managers move into top positions throughout the command.

(U) In approving the DARCOM Equal Employment Opportunity (EEO) Plan of Action for FY 1977-78, General John R. Deane stated that "Some positive progress has been accomplished toward correcting the imbalance and problem areas in respect to minorities and women, within our workforce. However, more aggressive and innovative actions are necessary so that the objectives and goals as outlined in the FY 1977-1978 Plan of Action can be met on a timely basis."^{2/} Outlined below are some of the approaches taken in the implementation of the plan.^{3/}

²Memorandum For: All DARCOM Employees, Subj: Equal Employment Opportunity, 18 Jan 77.

³DARCOM Equal Employment Opportunity Plan of Action for Fiscal Years 1977-1978, Part C, Report of Assessment.

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(U) Organization and Resources. Added emphasis was placed on the need for expeditious recruitment efforts to provide adequate staffing to effectively promote and administer the Equal Employment Opportunity Program. While the Headquarters DARCOM EEO Office stabilized, field activities continued to be beset by attrition. The high incidence of vacancies had forced the assumption of additional duties on other members of EEO and CPO staffs. Resulting problems encountered included the inability to establish reliable performance indicators with which to gauge productivity and cost effectiveness of personnel charged with EEO responsibilities; currency and timeliness of training for EEO program officials; and difficulty in maintaining controls with which to audit EEO program resources. Every effort was expended to alleviate these problems.

(U) To aid them in their work EEO Officers, in most instances, were given direct access to commanders, top management and supervisors throughout DARCOM on all matters relating to EEO program administration and complaint processing. There was some need for improvement in this area.

(U) Program officials will continue to receive appropriate training through CSC and DCSPER courses.

(U) Discrimination Complaints: The percentage of complaints which were resolved informally increased during this fiscal year which indicated that counselors were doing a thorough job and had adequate delegations. This improvement was probably the best evaluation factor to measure performance.

(U) Investigators are furnished and trained by the US Army Appellate Review Agency. The greatest time lag in processing complaints is in getting an investigator assigned for a case. Another cause is the lack of timeliness in holding the informal adjustment meeting to arrive at a proposed disposition.

(U) Recruitment. The PACE exam has made difficult the recruitment of minorities for entry level career positions. Also, the intake of Orientals and American Indians was inadequate.

(U) The DARCOM EEO participated in the establishment of minority group and female goals for the centralized intern program. Most career program recruitment and placement was centrally controlled, while other types of recruitment were delegated to the local level. Additional centralization would not increase the efficiency or effectiveness of the minority group or female recruitment effort.

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(U) Full Utilization of Skills and Training. There were no command studies that indicated time in grade for all employees which could be used to compare minorities and women with the majority male incumbents. Therefore it was not possible to trace upward movement of employees. Such a study could be done more readily for employees in career program positions. Additional effort was made to ensure that training opportunities were available on an equitable basis by grade, occupation, minority status, sex, and age.

(U) Upward Mobility. Concerted efforts were made throughout DARCOM to identify entry intermediate and target level positions for upward mobility candidates. Systematic approaches were taken in the establishment of such positions with the involvement of managers and all CPO functions taking part in the identification process. Many offices are making this an integral part of the cyclic audit. The number of employees involved in upward mobility programs who expect to be promoted or reassigned follow:

1. Into the same occupational series: 817
2. Into a different occupational series: 397

(U) Supervisory and Management Commitment. DA guidelines used in supervisory and managerial performance evaluation of knowledge and support of EEO program objectives were a significant factor in promoting participation in group sponsored activities, community outreach and committee memberships.

(U) Numerous incentive awards were granted in FY 1977 to DARCOM supervisors for exceptional contributions in support of equal employment opportunity.

(U) Community Outreach. EEO staffs will continue their vital roles in the flow or communication with community action groups keeping them apprised of employment trends, activity plans and schedules, and providing support and assistance to these groups.

(U) Participation in career days and job fairs at schools was an item of emphasis during the year. Also, many activities arranged follow-up tours of work sites for students showing interest in particular types of work. The interaction among CPO's/EEEO's and school counselors provided input into occupational study groups and cooperative education programs.

(U) Funding restrictions, reorganizations, and RIF's virtually halted the worker-trainee opportunities program. Future plans were to provide realistic placement projections.

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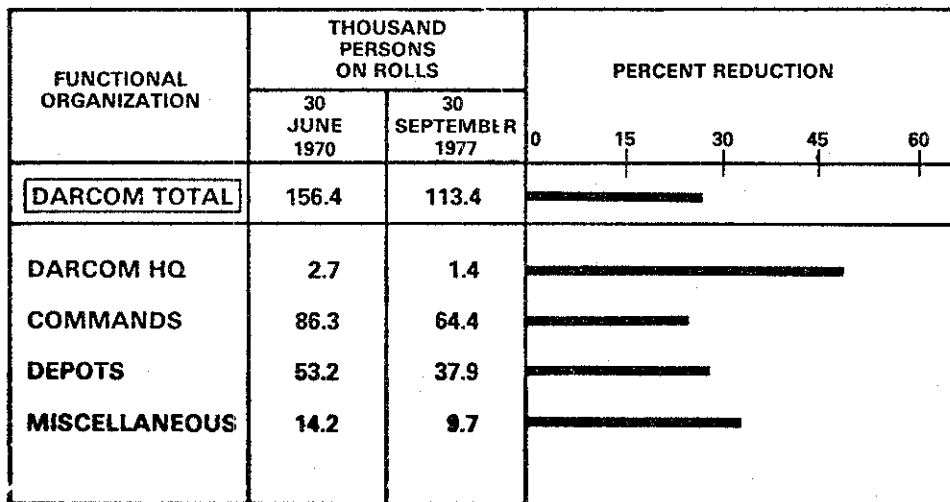
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(U) Program Evaluation. At Headquarters DARCOM, program evaluation was accomplished jointly by the Directorate for Civilian Personnel and the Command EEO Officer. Information sources used included quarterly narrative reports, DA workshops and training seminars, selected minority group data, and CPO-EEO conferences.

(U) A test was scheduled to be conducted in the near future to determine the feasibility of including data on quantifiable EEO AAP goals in the quarterly civilian personnel reports. This would provide nine months' experience on which to evaluate the EEO program; and also would provide a solid base on which to predict future program needs.

(U) Charts. Information on DARCOM personnel strengths (civilian and military)⁴, and equal employment opportunity appears on the following charts:

DARCOM PERSONNEL STRENGTH STATUS BY ORGANIZATION 30 JUNE 1970 - 30 SEPTEMBER 1977

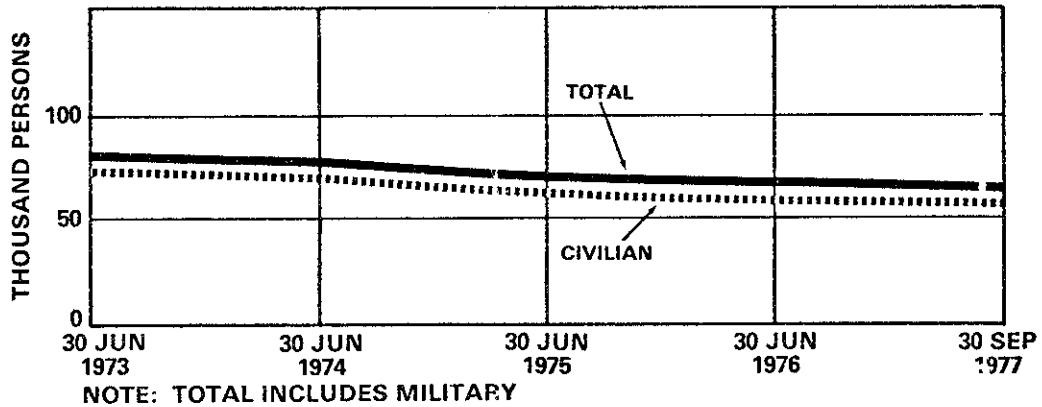


As of 30 September 1977, DARCOM personnel strength (civilian plus military) declined 43,000 or 27.5% below the 1 July 1970 strength. The details for MSC's depots and military are shown on the succeeding charts.

⁴All charts in this chapter were taken from the pamphlet, Data On Activity Trends in DARCOM, 1977, prepared by the Comptroller MR&A Division, DARCOM.

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**DARCOM PERSONNEL STRENGTH
CIVILIAN AND MILITARY
ALL MAJOR SUBORDINATE COMMANDS
30 JUNE 1973 THROUGH 30 SEPTEMBER 1977**



**INDIVIDUAL COMMAND COMPARISON
30 JUNE 1970 – 30 SEPTEMBER 1977**

| COMMAND | (THOUSAND PERSONS ON ROLLS) | | | | | | PERCENT OF CHANGE 10 20 30 40 |
|--------------|-----------------------------|------|-------|-------------|-----|-------|---|
| | 30 JUN 1970 | | | 30 SEP 1977 | | | |
| | CIV | MIL | TOTAL | CIV | MIL | TOTAL | |
| DARCOM TOTAL | 78.7 | 10.6 | 89.3 | 57.7 | 6.7 | 64.4 | <div></div> |
| AARCOM | N/A | N/A | N/A | 11.6 | 0.5 | 12.1 | <div></div> |
| ARRADCOM | N/A | N/A | N/A | 7.4 | 0.3 | 7.7 | <div></div> |
| AVRADCOM | N/A | N/A | N/A | 1.5 | 0.1 | 1.6 | <div></div> |
| ECOM | 10.7 | 1.6 | 12.3 | 8.3 | 1.2 | 9.5 | <div></div> |
| ILCOM | 0.4 | 0.0 | 0.4 | 0.5 | 0.0 | 0.5 | 2.5% INCREASE |
| MERADCOM | 1.3 | 0.1 | 1.4 | 1.2 | 0.1 | 1.3 | <div></div> |
| MIRCOM | N/A | N/A | N/A | 5.1 | 0.7 | 5.8 | <div></div> |
| MIRADCOM | N/A | N/A | N/A | 2.4 | 0.1 | 2.5 | <div></div> |
| NARADCOM | 1.3 | 0.2 | 1.5 | 1.1 | 0.1 | 1.2 | <div></div> |
| TARCOM | N/A | N/A | N/A | 4.2 | 0.3 | 4.6 | <div></div> |
| TARADCOM | N/A | N/A | N/A | 0.8 | 0.0 | 0.8 | <div></div> |
| TECOM | 9.9 | 4.9 | 14.8 | 8.4 | 3.0 | 11.4 | <div></div> |
| TSARCOM | N/A | N/A | N/A | 5.1 | 0.3 | 5.4 | <div></div> |

NOTE: DUE TO REORGANIZATION, FY70 DATA BASE IS NOT AVAILABLE FOR NEW COMMANDS

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DARCOM PERSONNEL STRENGTH MILITARY ALL MAJOR SUBORDINATE COMMANDS 30 JUNE 1970 VS 30 SEPTEMBER 1977

| OFFICER (INCLUDES WO's) PERCENT OF CHANGE | FY 70 | 30 SEP 1977 | COMMAND | FY 70 | 30 SEP 1977 | ENLISTED/ PERCENT OF CHANGE |
|---|-------|----------------|----------------------|-------|----------------|--------------------------------|
| 100 75 50 25 | | | | | | 25 50 75 100 |
| ..... | 4005 | 2729 | DARCOM TOTAL | 9261 | 6104 | ..... |
| ..... | 2647 | 2073 | TOTAL COMMANDS | 7921 | 5780 | ..... |
| | N/A | 210 | ARRCOM | N/A | 286 | |
| | N/A | 169 | ARRADCOM | N/A | 137 | |
| | N/A | 89 | AVRADCOM | N/A | 44 | |
| ..... | 377 | 297 | ECOM | 1272 | 927 | ..... |
| ... | 22 | 19 | LCOM | 3 | 1 | ..... |
| ..... | 27 | 21 | MERADCOM | 32 | 43 | ===== |
| | N/A | 166 | MIRCOM | N/A | 491 | |
| | N/A | 89 | MIRADCOM | N/A | 18 | |
| ..... | 54 | 29 | NARADCOM | 102 | 67 | ..... |
| | N/A | 99 | TARCOM | N/A | 151 | |
| | N/A | 27 | TARADCOM | N/A | 1 | |
| ..... | 814 | 410 | TECOM | 4050 | 2565 | ..... |
| | N/A | 139 | TSARCOM | N/A | 119 | |
| ..... | 412 | 309 | DESCOM ^{1/} | 808 | 930 | ===== |

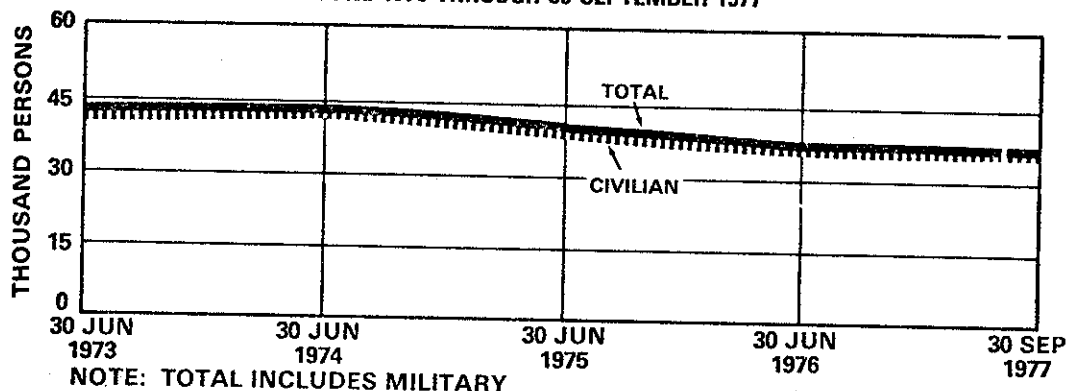
===== PLUS
..... MINUS

NOTE: Due to reorganization, FY 1970 Data Base was not available for new commands.

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DARCOM PERSONNEL STRENGTH CIVILIAN AND MILITARY ALL DEPOTS

30 JUNE 1973 THROUGH 30 SEPTEMBER 1977



INDIVIDUAL DEPOT COMPARISONS 30 JUNE 1970 - 30 SEPTEMBER 1977

| DEPOT | (THOUSAND PERSONS ON ROLLS) | | | | | | PERCENT CHANGE | | | | | |
|---------------------------|-----------------------------|-----|-------|-------------------|-----|-------|-----------------|----|----|----|----|----|
| | 30 JUNE 1970 | | | 30 SEPTEMBER 1977 | | | 10 | 20 | 30 | 40 | 50 | 60 |
| | CIV | MIL | TOTAL | CIV | MIL | TOTAL | | | | | | |
| DARCOM TOTAL | 51.7 | 1.5 | 53.2 | 36.7 | 1.2 | 37.9 | 20.0% INCREASE | | | | | |
| HQ DESCOM | 0.5 | 0.0 | 0.5 | 0.6 | 0.0 | 0.6 | | | | | | |
| ANNISTON | 3.9 | 0.0 | 3.9 | 4.9 | 0.0 | 4.9 | | | | | | |
| CORPUS CHRISTI | 4.3 | 0.1 | 4.4 | 3.4 | 0.0 | 3.4 | | | | | | |
| LETTERKENNY ^{1/} | 5.1 | 0.1 | 5.2 | 4.5 | 0.1 | 4.6 | | | | | | |
| NEW CUMBERLAND | 2.4 | 0.1 | 2.5 | 3.4 | 0.1 | 3.5 | 40.0% INCREASE | | | | | |
| RED RIVER ^{2/} | 9.8 | 0.1 | 9.9 | 5.5 | 0.1 | 5.6 | | | | | | |
| SACRAMENTO | 3.2 | 0.1 | 3.3 | 2.3 | 0.1 | 2.4 | | | | | | |
| SENECA | 0.9 | 0.3 | 1.2 | 0.7 | 0.4 | 1.1 | | | | | | |
| SHARPE | 3.2 | 0.1 | 3.2 | 1.5 | 0.1 | 1.6 | | | | | | |
| SIERRA | 1.2 | 0.2 | 1.4 | 1.6 | 0.2 | 1.8 | | | | | | |
| TOBYHANNA | 3.4 | 0.1 | 3.5 | 3.2 | 0.0 | 3.2 | | | | | | |
| TOOELE ^{3/} | 9.1 | 0.1 | 9.2 | 5.1 | 0.1 | 5.2 | | | | | | |
| OTHER ^{4/} | 4.7 | 0.2 | 4.9 | 0.0 | 0.0 | 0.0 | TOTAL REDUCTION | | | | | |

1/ INCLUDES SAVANNA

2/ INCLUDES LEXINGTON-BLUE GRASS

3/ INCLUDES FT. WINGATE, NAVAJO, PUEBLO, AND UMATILLA

4/ OTHER: 1970-ATLANTA, CHARLESTON, AND GRANITE CITY

5/ INCLUDES MAINZ AND OBER-RAMSTADT

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DARCOM PERSONNEL STRENGTH MILITARY ALL DEPOTS

30 JUNE 1970 VS 30 SEPTEMBER 1977

| OFFICER (INCLUDES WO's) PERCENT OF CHANGE | FY 70 | 30 SEP 1977 | DEPOT | FY 70 | 30SEP 1977 | ENLISTED PERCENT OF CHANGE |
|---|-------|----------------|---------------------------|-------|---------------|-------------------------------|
| 100 75 50 25 | | | | | | 25 50 75 100 |
| ..... | 412 | 309 | TOTAL DEPOTS | 808 | 930 | ..... |
| 183.3% INCREASE | 6 | 14 | HQ DESCOM | 15 | 16 | ..... |
| ..... | 27 | 30 | ANNISTON | 13 | 24 | ..... |
| ..... | 33 | 16 | CORPUS CHRISTI | 9 | 22 | 144.4% INCREASE |
| ..... | 43 | 24 | LETTERKENNY ^{1/} | 155 | 42 | ..... |
| ..... | 30 | 27 | NEW CUMBERLAND | 23 | 44 | ..... |
| ..... | 48 | 36 | RED RIVER ^{2/} | 38 | 75 | ..... |
| ..... | 24 | 27 | SACRAMENTO | 56 | 59 | ..... |
| ..... | 37 | 29 | SENECA | 257 | 323 | ..... |
| ..... | 32 | 16 | SHARPE | 54 | 35 | ..... |
| ..... | 27 | 23 | SIERRA | 132 | 226 | ..... |
| ..... | 31 | 19 | TOBYHANNA | 45 | 25 | ..... |
| ..... | 74 | 44 | TOOELE ^{3/} | 11 | 31 | 181.8% INCREASE |
| N/A | N/A | 4 | OTHER ^{4/} | N/A | 8 | |

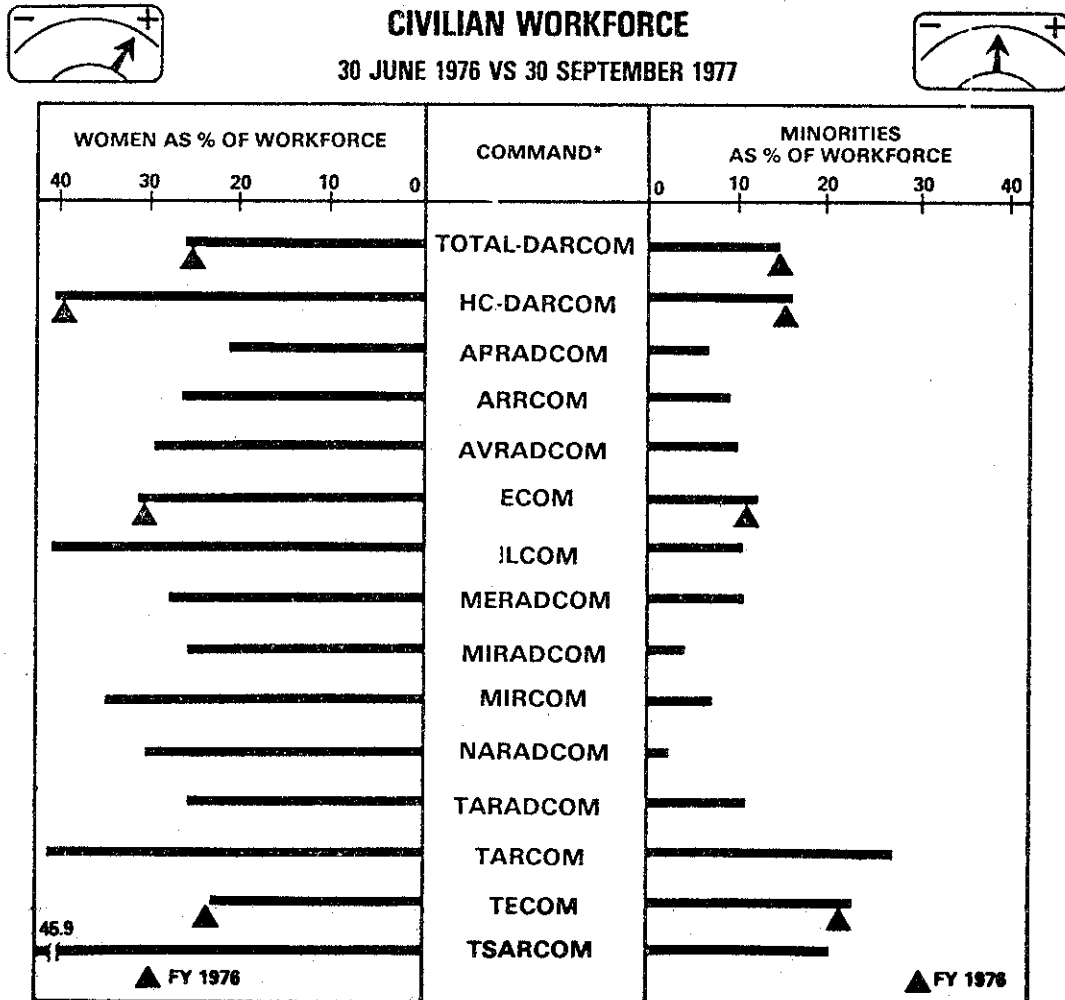
—— PLUS
..... MINUS

- 1/ Includes Savanna
2/ Includes Lexington Blue-Grass
3/ Includes Ft. Wingate, Navajo, Pueblo and Umatilla
4/ Other includes Mainz and Ober Ramstadt

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DISTRIBUTION OF WOMEN AND MINORITIES IN
CIVILIAN WORKFORCE

30 JUNE 1976 VS 30 SEPTEMBER 1977



*Due to reorganization of FY 1976 data not available for new commands.

Overall women in the DARCOM civilian workforce made slight gains; minorities stayed the same when compared to FY 1976.

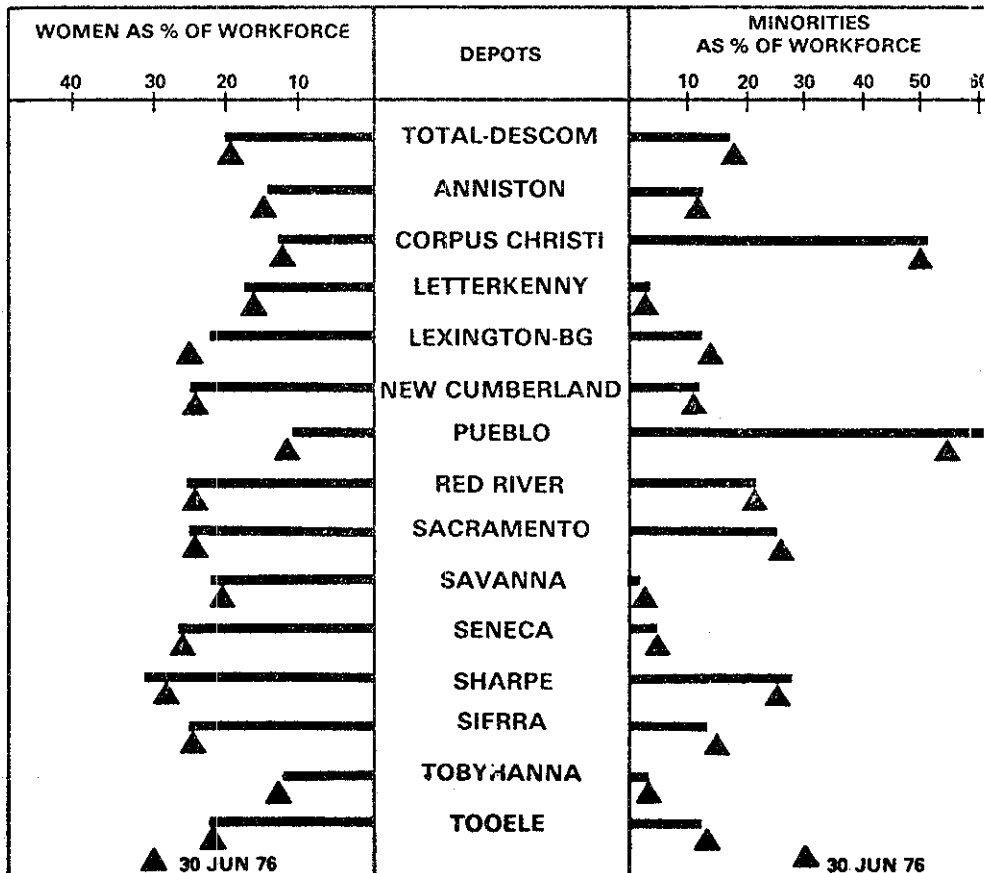
At Headquarters, DARCOM, women as a percent of the workforce increased 1.0 percent and minorities 0.6 percent.

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DISTRIBUTION OF WOMEN AND MINORITIES IN CIVILIAN WORKFORCE

30 JUNE 1976 VS 30 SEPTEMBER 1977



Overall, the percentage of women in the depot workforce increased slightly. However, the percent of minorities in the workforce declined.

Pueblo Army Depot showed the greatest improvement in minorities, an increase of 6.5 percent. The change was attributed to project CONCISE which disbursed Pueblo's distribution mission and resulted in a significant number of retirements in lieu of transfer.

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Materiel Development

(U) The XM1 Tank Development Program continued to achieve success following the selection of the Chrysler prototype tank system to enter scale engineering development.^{5/} Chrysler Corporation agreed to deliver 11 pilot vehicles for use in testing.^{6/} The Lima (Ohio) Army Modification Center was chosen as the initial production site.

(U) Substantial progress toward NATO standardization was made by the XM1 Project Manager's Office in orchestrating the comparative testing of the FRG's Leopard 2AV Prototype Systems and the FRG/UK/US firing trials at Aberdeen Proving Ground in pursuit of the optimal tank main gun armament. In order to field the XM1 at the earliest possible date, a decision was made to produce it initially with a 105mm gun. The German 120mm rifled gun was being evaluated for possible use on later XM1's since the basic tank design was compatible with either gun.

(U) When fielded, the XM1 will contain an advanced fire control system which will include a digital ballistic computer and stabilized turret. This will enable the gun to shoot on-the-move with high first-round hit probability. Increased survivability will be made possible by improved ballistic protection.

(U) Fighting vehicle systems (FVS) was formerly known as the mechanized infantry combat vehicle (MICV). The redesignation took place in November 1976 when the Secretary of the Army reoriented the MICV toward the development of a dual purpose fighting vehicle for use by both mechanized infantry and armored cavalry units. Prior to this, two separate vehicles were being developed.

(U) The FVS will employ a two-man turret with a fully stabilized, dual-fed 25mm automatic cannon, a coaxial 7.62mm machine gun and a two-round TOW antitank missile launcher. It will be a fighting vehicle as well as a troop carrier.

(U) In recent tests the FVS demonstrated cross-country speeds comparable to those achieved by the XM1. This mobility was essential

⁵The remainder of this chapter is based substantially on "DARCOM Significant Achievements - 1977," inclosure to letter from GEN John R. Deane, Jr. to GEN Bernard W. Rogers, 28 Jan 77.

⁶ARMY, "No Weak Links in the Readiness Chain," by GEN John R. Guthrie, October 1977.

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because the vehicle was designed to accompany the XM1 and operate as part of a combined arms, tank-led, combat team.

(U) The advanced attack helicopter (AAH) was approved in December 1976 by the Defense Systems Acquisition Review Council for entry into full-scale engineering development. Hughes Helicopter was selected as the prime aircraft system contractor for this phase, which included fabrication of three additional aircraft, subsystems development and testing, and integration of the subsystems into the aircraft.

(U) Target acquisition detection system, pilot night vision system, and the helicopter-launched fire-and-forget (HELL-FIRE) anti-tank missile system were among the major subsystems. The subsystems were to be integrated into an aircraft which offered major improvements in mobility, survivability, reliability and maintainability, thus making it a highly effective airborne weapons platform.

(U) The utility tactical transport aircraft system (UTTAS), designated the UH-60A, was the Army's first true squad assault helicopter. It had a payload great enough to transport a complete infantry squad and equipment plus the craft's crew. It was designed to remain with the troops in the field and be relatively free of the maintenance problems associated with previous helicopters.

(U) Also, it was a highly survivable aircraft, incorporating full protection against small-arms fire, crashworthy, self-sealing fuel cells and up-to-date antiaircraft countermeasures. Its survivability was demonstrated in August 1976 when a Sikorsky prototype lost power in the dead of night and fell into a stand of pines. The crew and 14 passengers were unharmed. The project officer had the nearby trees chopped down, a new set of rotor blades installed, and the craft was flown out.

(U) Sikorsky Aircraft was selected in December 1976 as the winner of the developmental competition. Final developer and user testing was continuing simultaneously with preproduction tooling and fabrication. The program called for a total production of 1,107 aircraft from fiscal 1977 to 1985.

(U) Patriot, with the above four systems, constitute the Army's "Big Five" programs. These systems will make the greatest contribution to the Army's combat power once they are fielded.

(U) This system is the Army's air-defense missile for the 1980's and beyond. The Patriot will have a high kill probability and multiple simultaneous engagement capability in an intensive electronic-countermeasures environment.

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(U) In 1975 the Patriot successfully completed an extensive series of "proof of principle" firings which demonstrated the soundness of the track-via-missile guidance concept. It also demonstrated the Patriot's capabilities against maneuvering targets, formation targets and a low-altitude target in clutter. In addition, the system provided a reduction in manpower and maintenance requirements compared to the Hercules and Hawk systems which it will replace.

(U) The Army thought the program so successful that a special Army Systems Acquisition Review Council approved an accelerated production-and-deployment schedule in February 1977. If a DOD program review were to agree, the initial operational capability date was to be advanced by two years.

(U) Copperhead. A 155mm guided projectile that could be fired from any 155mm howitzer, the Copperhead was designed to be used with a laser designator which could be hand-held or mounted on a helicopter or remotely piloted vehicle. The laser designator illuminated a portion of the target with pulse-coded energy. Using a detector sensitive to that energy, the Copperhead acquired and tracked the energy reflected from the target. This tracking information was then used to operate control fins which guided the projectile toward the target. This missile gave the field artilleryman a high single-shot kill probability against moving and hardened targets.

(U) Copperhead had been the subject of several DOD commonality studies with the Navy guided projectile projects. Since these studies found that the Army projectile was two years ahead of the Navy version in its development, the Army was assigned as lead service for the development of all semi-active laser-guided projectiles. The Army was directed to manage developments to meet the Navy requirement for five and eight inch guided projectiles in order to maximize commonality with the existing 155mm Copperhead in meeting those requirements.

(U) SOTAS. The stand-off target acquisition system (SOTAS) will bring a new dimension to the battlefield. It will provide the Army with a new and tactically important capability to detect moving ground targets at ranges beyond the forward edge of the battle area. SOTAS will locate these targets with an accuracy compatible with both Army and Air Force strike systems.

(U) The SOTAS consisted of an airborne platform, currently a UH-1H, on which was installed a moving target indicator (MTI) radar system. MTI video data referenced to a UTM grid was transmitted by means of a real-time data link to a ground station where "targets" were detected and located, and from which combat information was passed directly to the division tactical operations center or other

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users. Thus, the division commander will have the ability to "see" behind enemy lines to detect troop movements and force concentrations.

(U) Aside from the "Big Five" which got the most publicity, there were major scientific and engineering breakthroughs in the field of terminal ballistics. Also enhanced was the fundamental understanding of dynamics and interactions of tank weapons, ammunition and armor. This will help the Army to intensify the survivability and combat effectiveness of vehicles such as the XM1 and FVS. It will also permit the development of improved anti-armor weapons such as a new 105mm antitank round for the XM1 and the advanced heavy antitank missile system, the successor to the TOW wire-guided missile which was in the advanced development phase.

(U) Laboratories generated the raw material for the weapon systems of the future. Accomplishments in this area spanned the entire DARCOM development effort. This encompassed the rocket-delivered fuel-air explosives designed to break minefields, reduced-volume combat rations, development of methanol-air fuel cell power plants, and high-performance glass-plastic laminate transparent armor for helicopters. In these and other areas, DARCOM laboratories generated the raw material for the weapon systems of the future.

(U) Product improvement is another approach to increased combat power. A good example was a new modification kit for the standard M109 self-propelled 155mm howitzer. Use of the kit extended the range substantially at a cost of \$140,000 a gun. This was in contrast to producing a new M109A1 with the same capability at an estimated cost of \$360,000.

(U) Other benefits that were derived from product improvement included the safety factor. A self-sealing, crashworthy fuel cell was successfully tested and procured for the CH-47 helicopter. Other improvements were in the area of reliability, availability, and maintainability.

(U) Improvements made to the M60 tank substantially increased operational availability and reduced downtime and maintenance. These included a long-life component, a 750-horsepower engine, an oil-cooled alternator, and a solid-state regulator. With other improvements in combat power due to add-on stabilization and night-vision capability, the reconfiguration was so extensive that this model was redesignated M60A3.

(U) An area of concern within DARCOM was the manufacturing technology program. It was important to translate what was learned in the laboratory into cost-effective, mass-production techniques.

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The results at times were dramatic. The hand-held thermal viewer (AN/PAS-7), used for night vision, was purchased by the Army at a unit cost of \$36,442 in 1975. In this fiscal period the same item was purchased for \$15,707, for a saving of \$10 million in one year alone.

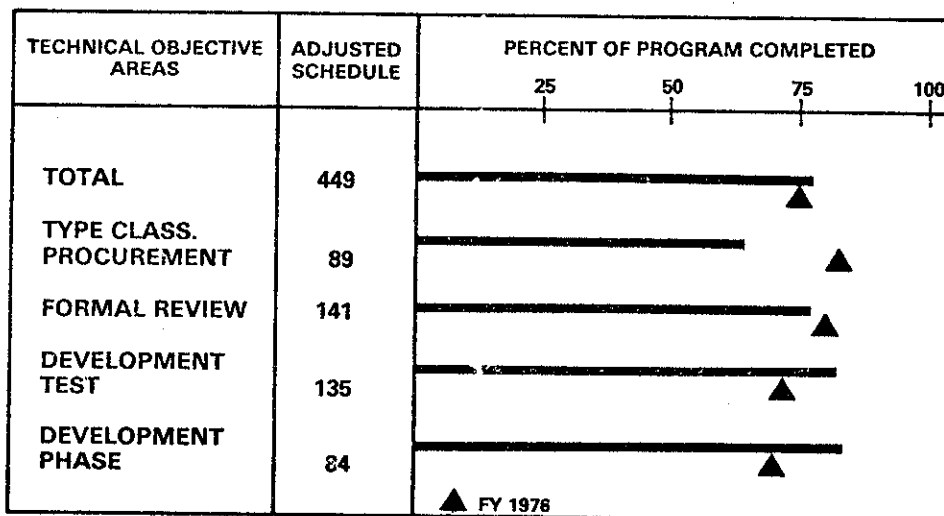
(U) Manufacturing technology projects were a main contributor to this cost decrease, addressing production technology for the photo-detector module, the thermoelectric cooler and the light-emitting diode display. Work on these components not only lowered production costs, but also increased the capability of the production base to manufacture these items in quantity.

(U) To improve the transfer of manufacturing technology from Army-funded projects to other services, DARCOM in conjunction with the National Technical Information Service of the Department of Commerce, devised Tech Note. This service collected one-page inputs from government agencies and sent them to subscribers. Through this program, DARCOM ensured that other government agencies, and private industry, benefited from breakthroughs in production technology.

(U) A substantial part of the research and almost all of the production that supports the Army development effort was performed by civilian industry. Consequently, the nature of the relations between the Army and industry had a major impact on the performance of the DARCOM mission.

(U) Charts. DARCOM performance in the field of materiel development is illustrated below:

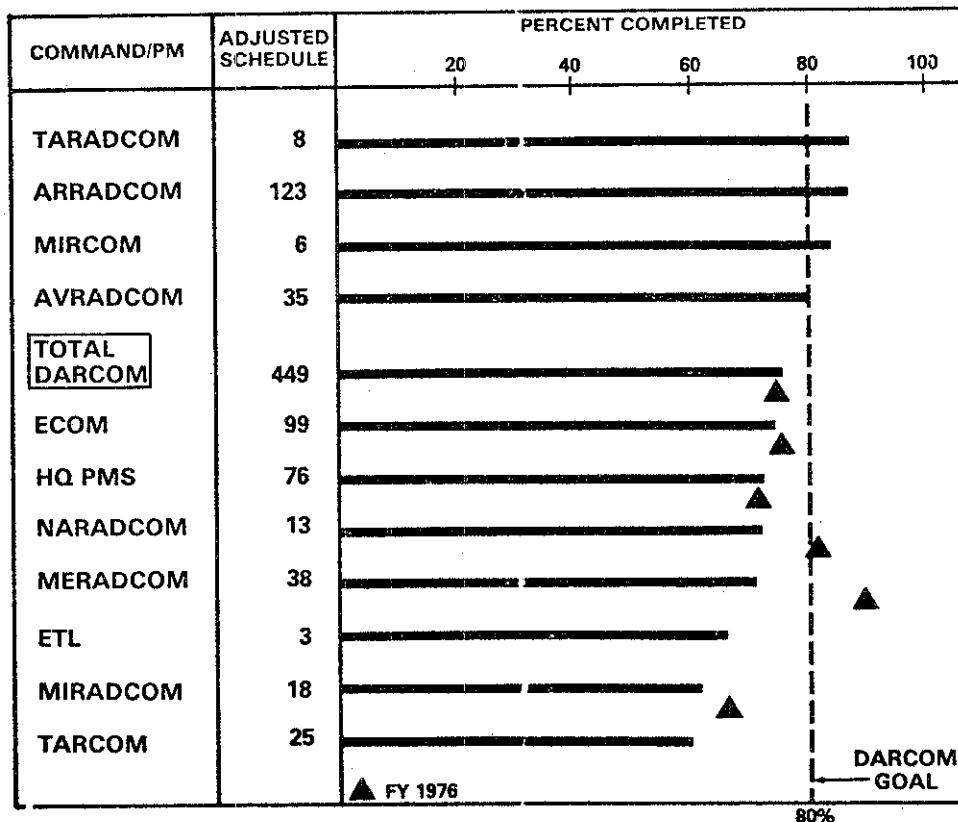
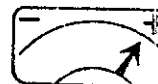
DARCOM RDT&E TECHNICAL OBJECTIVES COMPLETIONS STRATIFIED BY TECHNICAL OBJECTIVE AREA FY 1977



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(U) Of the 449 technical objectives scheduled for the year end FY 1977, 344, or 76.6 percent were completed. In comparison with FY 1976, performance improved slightly. Breakout by command is shown on the next chart.

DARCOM RDT&E TECHNICAL OBJECTIVES ADJUSTED SCHEDULE VS COMPLETIONS FY 1977



NOTE: Due to the reorganization, FY 1976 information was not available for new commands.

Overall DARCOM did not achieve its 89 percent goal. Four commands exceeded or met the goal. The primary reasons given by commands for not achieving the goal were:

- Initial planning did not provide realistic scheduling.
- Testing led to hardware/design changes making milestone schedule adjustments necessary.
- Changes directed by higher authority or actions by other organizations.

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Materiel Management and Readiness

(U) Materiel Management. Stock availability continued to improve reaching 83 percent, only two points lower than the DOD goal of 85 percent. This represented the highest annual fill rate since the goal was established in 1967. Distribution Effectiveness, a new performance indicator, which measured the percent of shipments from DARCOM distribution depots, was 60 percent halfway through FY 1977. Efforts continued to further increase this fill rate to approximately 90 percent.

(U) The Direct Support System (DSS) was a key element in the Army's goal to streamline its logistic system and provide more responsive battlefield effectiveness. Extension of DSS to TRADOC and FORSCOM installations was completed. Additionally, the system was extended to installations of the Communications Command, the Army Security Agency, and MDW. In this period, over 500 units and activities were being supported under DSS.

(U) On 7 November 1975, DA transferred the management responsibility for all retrograde of Okinawa excess equipment to DARCOM. All demand supported usable stocks were returned to CONUS for redistribution after being screened for utilization against requirements in the Pacific Theater of Operations. Included in the project were Army owned DSA/GSA managed items. As of 30 September 1976 the project was essentially complete, except for some small receipts of DSA/GSA excess materiel at Sacramento Army Depot. Of the 24,375 short tons of materiel involved, 75 percent, representing \$39 million of usable assets, was moved to CONUS or utilized in the Pacific Theater. The remainder was disposed of as non-demand supported, non-reparable or obsolete.

(U) As a result of an ASD(I&L) moratorium on shipment of materiel to PDO, CONUS posts, camps and stations built up an estimated \$12 million worth of DSA/GSA managed excess materiel. To clear up these excesses, DARCOM implemented a pilot program for shipment of demand supported excess materiel for Forts Ord, Lewis, and Carson to Sacramento Army Depot, utilizing procedures developed under the Okinawa Retrograde Program. A pilot program was conducted to utilize excesses from September 1976 through January 1977. Initial evaluation indicated that the program would be proliferated to other posts, camps and stations during the remainder of 1977. Also, procedures were developed and coordinated for the return of excess materiel subsequent to the phase down of USAREUR's depots.

(U) The establishment of an Air Line-of-Communications (ALOC) to fly all but selected repair parts to USAREUR became fundamental to the USAREUR MODLOG program. ALOC served to greatly reduce the time required

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to get repair parts to USAREUR, and thereby improve the materiel readiness of our forces in Europe. DARCOM participated with the Army Logistics Center and USAREUR in a study to develop the procedures to be used in the ALOC. This pre-test showed the ALOC procedures to be sound. During this ten day pre-test, a total of 882 short tons of repair parts were airlifted to Europe.

(U) Full responsibility for all depot maintenance in Europe was assumed by DARCOM on 1 July 1976. The multi-commodity program averaged \$50 to \$65 million annually, and included the management of the Mainz and Ober-Ramstadt maintenance facilities. This action enabled USAREUR to concentrate a greater management effort on improving and maintaining total USAREUR readiness by redirection of effort previously devoted to depot maintenance.

(U) Changes were begun to realign DARCOM equipment maintenance philosophy. The new approach was a philosophy adopted from industry called Reliability Centered Maintenance Strategy (RCMS). Under RCMS, scheduled maintenance was targeted and restricted to design reliability. The implementation plan for this program was completed and being carried out by the Commodity Commands, Project Managers, and the Army Maintenance Center. This change in maintenance philosophy was thought to reduce significantly scheduled maintenance requirements, improve availability and reduce overall maintenance costs.

(C) Readiness. A slight improvement was evidenced in the status of Active Army unit readiness. Of 872 units reporting readiness, 814 (93 percent) achieved their Assigned Level of Organization (ALO) in the Equipment on Hand (EOH), and 693 (80 percent) achieved their ALO in the Equipment Status (ES) category. FORSCOM and USAREUR both met or exceeded the DA goal of 95 percent in EOH.

(C) Steady progress was made toward bringing the three new divisions (5th, 7th and 24th) to their required ALO. Also, the percentage of fill of the EOH Readiness Condition (REDCON) C-2 had been increasing steadily. In the meantime the 24th Infantry Division was at 90 percent fill, the 7th Infantry Division was at 80 percent fill, and the 5th Infantry Division was at 83 percent fill. Capability studies indicated that DARCOM would meet or exceed the established DA goal for attainment of ALO within the three new divisions in the required time frame.

(U) Memoranda of Understanding (MOU) for application of modifications to fielded equipment were successfully negotiated by DARCOM with the major commands, except USAREUR where the MOU was awaiting

final signature within that command. Additionally, individual MOU's were negotiated between DARCOM Readiness Commands and the TRADOC/FORSCOM installations, the USAREUR subordinate commands, and Eighth Army for the application of modifications to equipment in the hands of users.

(U) DARCOM renewed emphasis on Integrated Logistics Support (ILS) planning in the acquisition of Army materiel. A command-wide ILS meeting which resulted in mutual understanding of ILS objectives, regulations, procedures, and tasks. This was followed by staff visits to each DARCOM command and selected PM's. DARCOM was striving to assure that all interfaces with other major commands that was to enhance ILS execution during the acquisition cycle were identified and responsibilities fixed and agreed upon to avoid any misunderstanding or oversight in ILS planning. A Logistics Command Assessment of Projects (LOGCAP) program was instituted to provide greater assurance prior to deployment of that materiel that could have been supported or sustained. The first LOGCAP was presented in November 1976 on the Military Tactical Transport Aircraft System (UTTAS). This LOGCAP provided an in-depth assessment of the principal elements of ILS and presented an excellent summary of ILS planning and work accomplished by the PM's office.

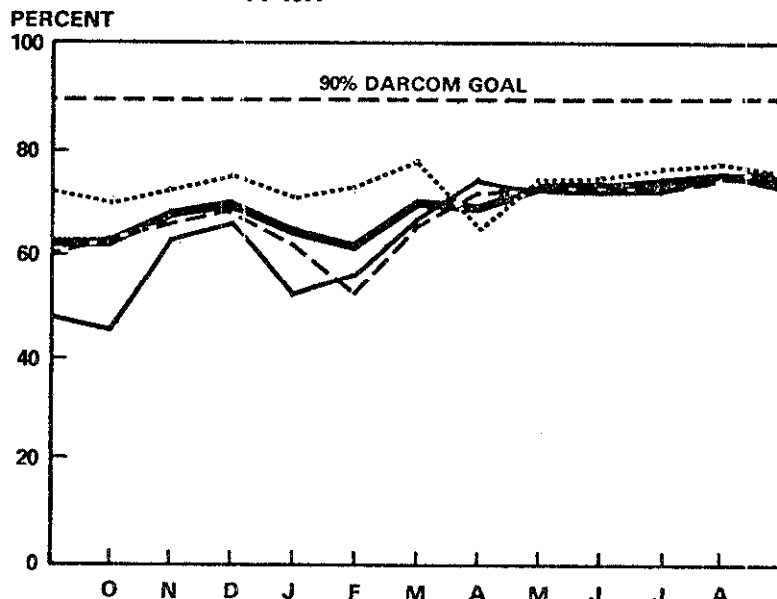
(U) The fielding of materiel under Project Hand-Off policies and procedures continued with prime examples being M60A2 tanks, M880 trucks, and COBRA-TOW. A number of lessons were learned, and the overall field reaction was favorable. The deployment was considered to have been more successful than it would have been under the previous fielding methods. For the M880 trucks, support and user personnel were trained in advance of delivery, thereby avoiding a problem that was experienced with the M60A2 tanks. The M880 was the first large fielding of a commercial item by DARCOM. These trucks had a one year or 12,000 mile manufacturers warranty. The impact of Hand-Off in CONUS was not quite as visible, since support for the trucks was obtained from local dealerships for service and parts. In Europe, however, the benefits derived from the Hand-Off program were apparent from the start, since some trucks were damaged in transit. Under previous procedures, the user would have accepted the responsibility for repair. However, based upon the new policy, DARCOM teams provided the assistance required in restoring the trucks to full operation prior to issue to the troops. The experience and knowledge gained from these efforts paved the way for COBRA-TOW deployment. This was the most successful initial deployment through the Hand-Off procedures. In view of the success of this program, it was to be extended to all major systems fielded in the future.

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(U) Charts. The DARCOM performance in the areas of material management and readiness is reflected in the following charts:

DARCOM SUPPLY PERFORMANCE DISTRIBUTION EFFECTIVENESS - DARCOM

FY 1977



| | | | | | | | | | | | | |
|----------------|----|----|----|----|----|----|----|----|----|----|----|----|
| TOTAL | 63 | 69 | 71 | 65 | 62 | 71 | 70 | 74 | 74 | 75 | 76 | 76 |
| NEW CUMBERLAND | 70 | 73 | 76 | 72 | 74 | 78 | 65 | 75 | 75 | 77 | 78 | 76 |
| RED RIVER | 63 | 66 | 69 | 62 | 52 | 65 | 73 | 74 | 73 | 73 | 75 | 77 |
| SHARPE | 46 | 63 | 66 | 52 | 57 | 67 | 75 | 73 | 73 | 73 | 76 | 74 |

This indicator of performance measures progress in positioning stock in the proper depot and represents the percentage of lines shipped out of that depot to its designated support area. The target for this performance was 90 percent. Since January 1975 when DARCOM went to the three distribution depots concept, overall distribution effectiveness has increased from 32 percent to 76 percent as of September 1977.

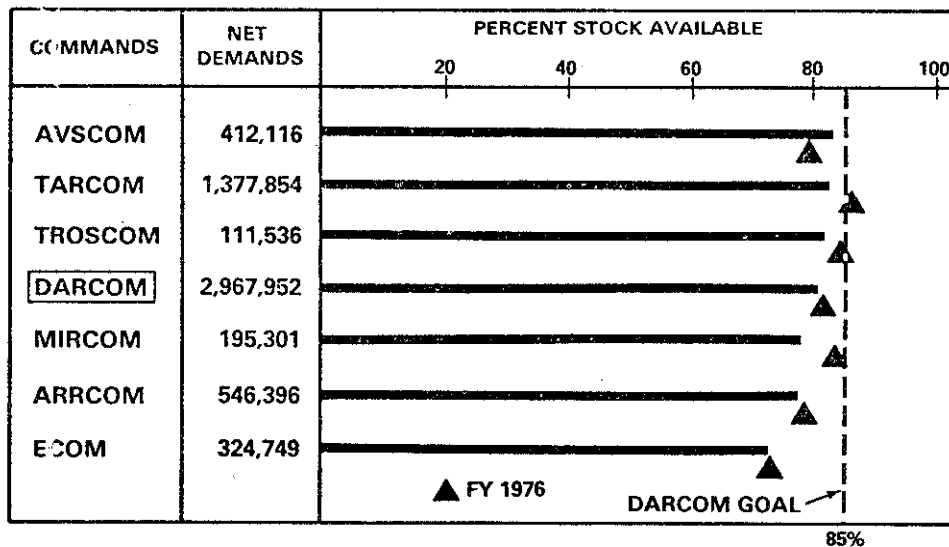
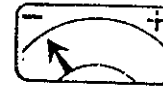
Major reasons for the 14 percent shortfall from the DARCOM target were:

- Distribution of low frequency demand items were not in balance at the distribution depots.
- Initial distribution depot allocations of procurement quantities too often prove to be inconsistent with demand pattern.
- Demand issue patterns change over the procurement leadtime which results in stock imbalances.

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TOTAL STOCK AVAILABILITY
% STOCKED ITEM REQUISITIONS SHIPPED
ON FIRST AVAILABILITY CHECK

FY 1977



Performance decreased slightly from 81.8 to 80.6 percent at the end of FY 1977 and fell short of DARCOM goal. Causative factors were:

- Follow-on effect of actions taken in FY 1976 to generate stock fund cash.
- Increased demands for fill of ASL's and PLL's for 3 new Army divisions.

The significant specific problems were:

- Demands placed on ARRCOM for chemical protective equipment (long lead time for difficult to produce items).
- TARCOM's conversion to Commodity Command Standard System (CCSS).

All requisitions received by DARCOM, and the conversion, dropped TARCOM's pre-CCSS fill rate from 87 percent to 82 percent.

A DARCOM-wide Ad Hoc Group has been established to develop a recovery plan.

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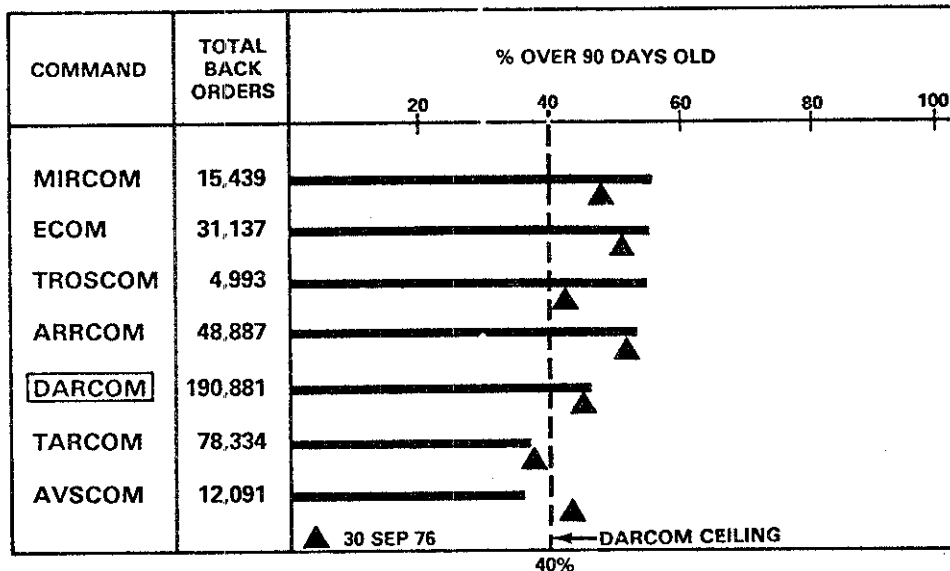
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MATERIEL OBLIGATIONS OUTSTANDING (BACKORDERS)

% BACK ORDERS OVER 90 DAYS OLD

(TOTAL STOCKED ITEMS)

AS OF 30 SEPTEMBER 1977

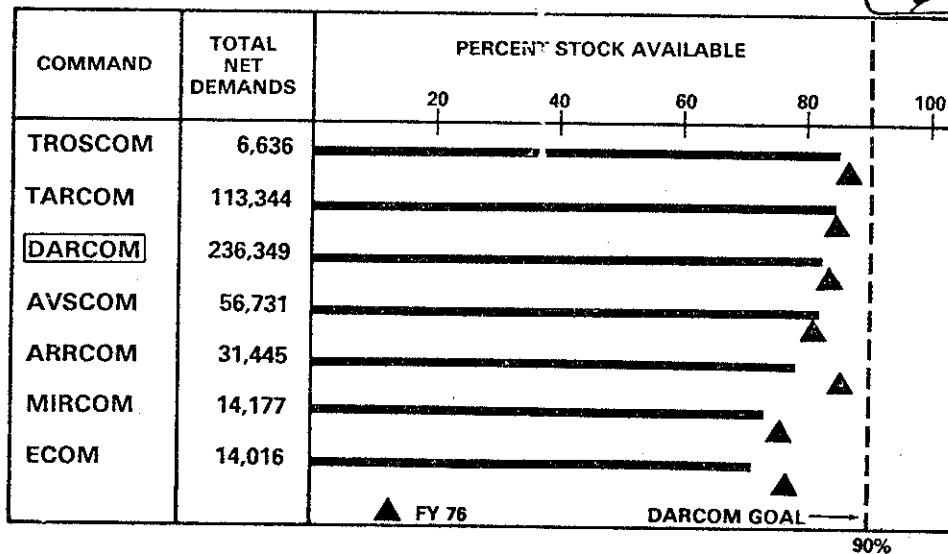


Overall DARCOM backorders over 90 days old increased slightly and remained above the established ceiling of 40 percent. Backorder aging increased at all commands, except AVSCOM and TARCOM, and was attributed to the declining stock availability rate, increased procurement workload (volume of PWD's) produced under Commodity Command Standard (CCSS) and contractor delays.

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STOCK AVAILABILITY
TOTAL NORS
% STOCKED ITEMS
REQUISITIONS SHIPPED ON FIRST AVAILABILITY CHECK
FY 1977



Overall DARCOM performance was 8 percent below goal in FY 1977. No command achieved the DARCOM goal of 90 percent for FY 1977. When compared with FY 1976 only AVSCOM showed improvement. It is recognized that some problems still exist with availability of repairable items which continue to impede progress toward attaining the 90 percent objective. Total net demands were up by over 20 percent from 194,061 to 236,349.

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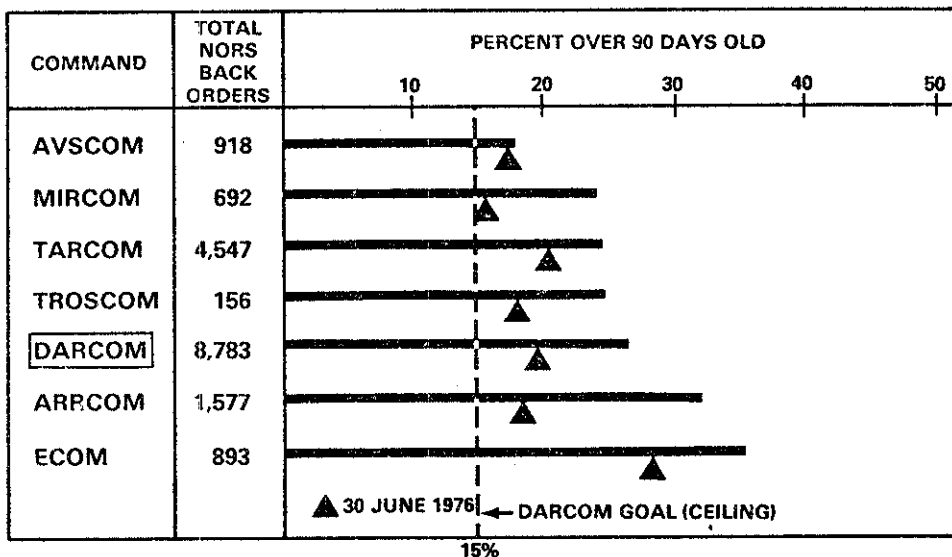
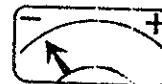
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MATERIEL OBLIGATIONS OUTSTANDING (BACK ORDERS)

NORS

% BACKORDERS OVER 90 DAYS OLD

AS OF 30 SEPTEMBER 1977

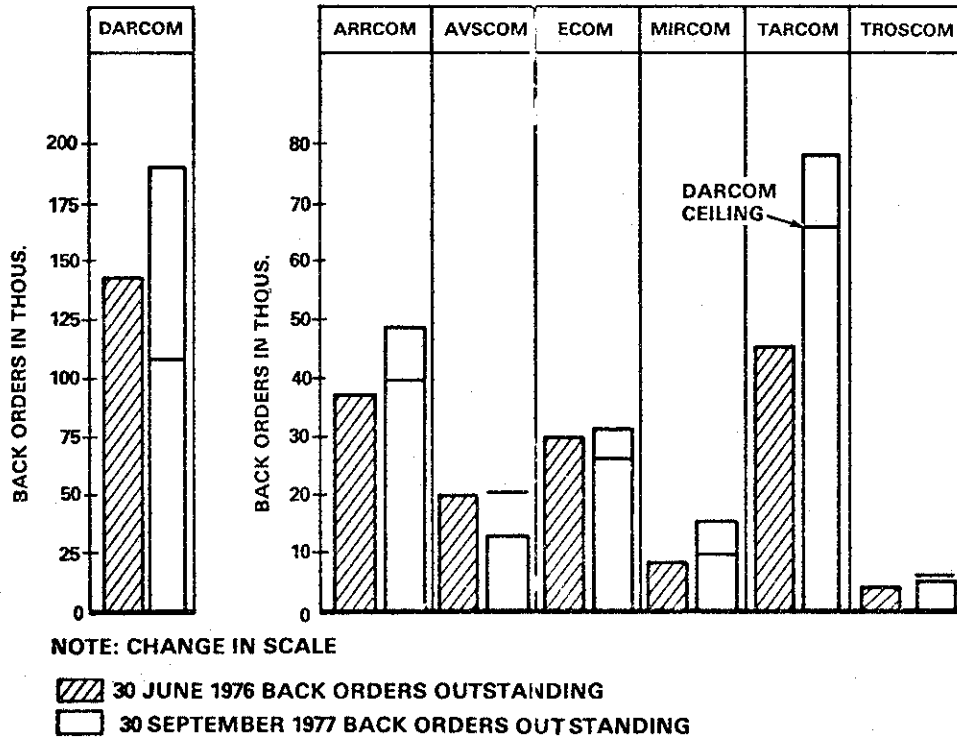


Overall, DARCOM continued to exceed the 15 percent ceiling. Growth in NORS backorder aging occurred at all commands. Increased procurement leadtimes and low availability rates for Procurement Appropriation Army (PAA) secondary items were primary contributing factors.

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**MATERIEL OBLIGATIONS OUTSTANDING (BACK ORDERS)
REDUCTION OF TOTAL BACK ORDERS
(TOTAL STOCKED ITEMS) AS OF 30 SEPTEMBER 1977**



Backorders increased 33 percent in FY 1977 due to:

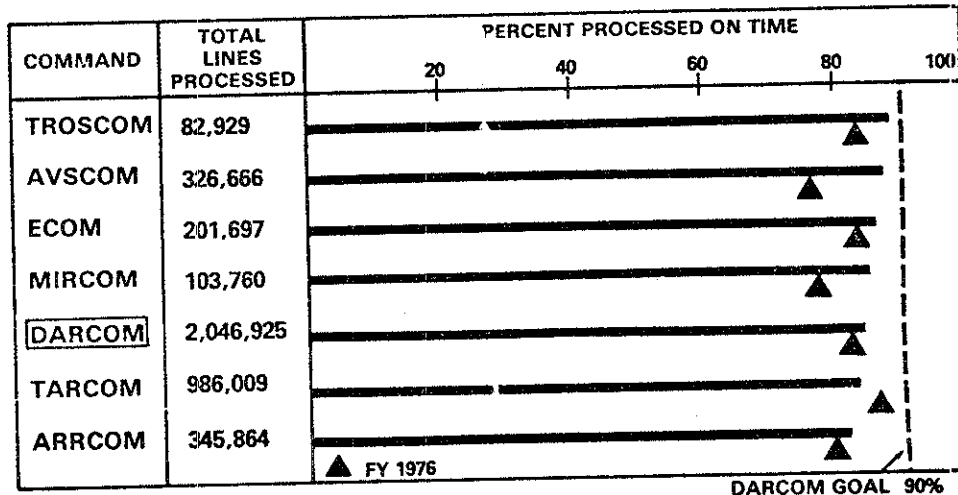
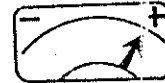
- a. Increased demands (3 new Army divisions).
- b. Slippage in planned obligation rates (ARRCOM).
- c. TARCOM's conversion to CCSS.

Based on previous experience with conversions, the increase was anticipated; however, an early recovery is expected.

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REQUISITION PROCESSING
IMMEDIATE ISSUES
TOTAL SUPPLY SOURCE (ALL IPGS)
FY 1977



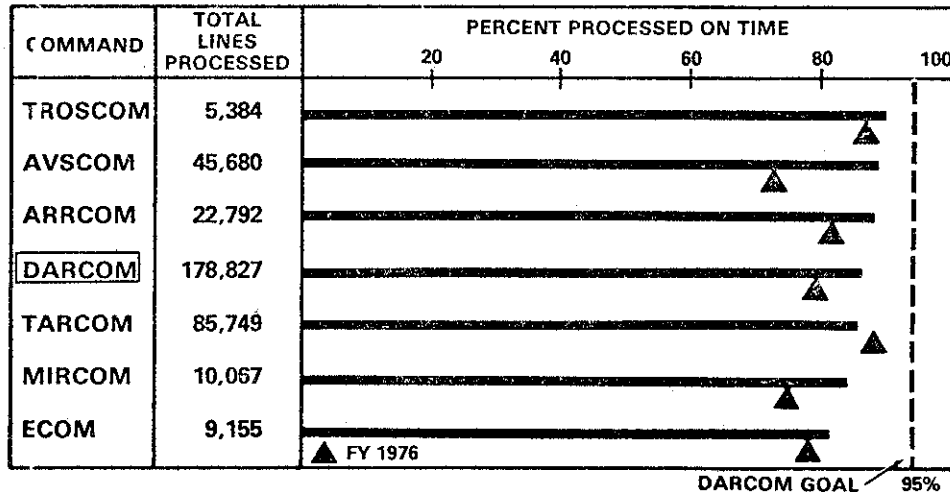
For FY 1977, the DARCOM goal of 90 percent was not achieved by any readiness command due to inadequate supply funding which virtually precluded overtime and also limited weekend work at NICP's and Depots. Despite funding constraints, on-time performance, except for TARCOM, improved at the NICP's.

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REQUISITION PROCESSING IMMEDIATE ISSUES*

NORS
SUPPLY SOURCE (ALL IPGS)
FY 1977



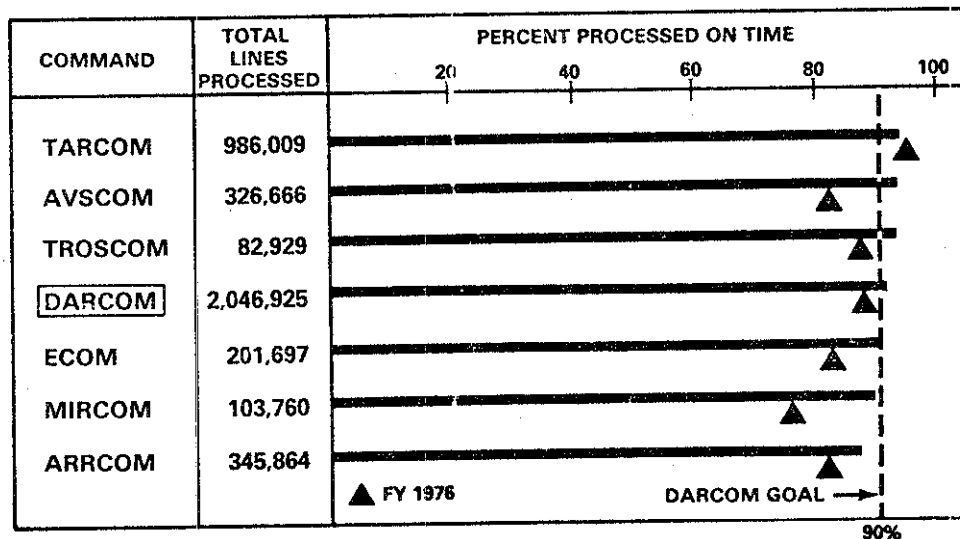
*Excludes Back Order Releases.

The DARCOM goal of 95 percent on-time performance for Not Operationally Ready Supplies (NORS) was not achieved in FY 1977 for the same basic reason as overall performance, namely funding shortages. Improvement was realized at most commands over FY 1976. NORS processing standards were very tight and required overtime and weekend work to achieve a high level of performance.

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REQUISITION PROCESSING
IMMEDIATE ISSUES
NICP (ALL IPGS)*
FY 1977



*Excludes Back Order Releases.

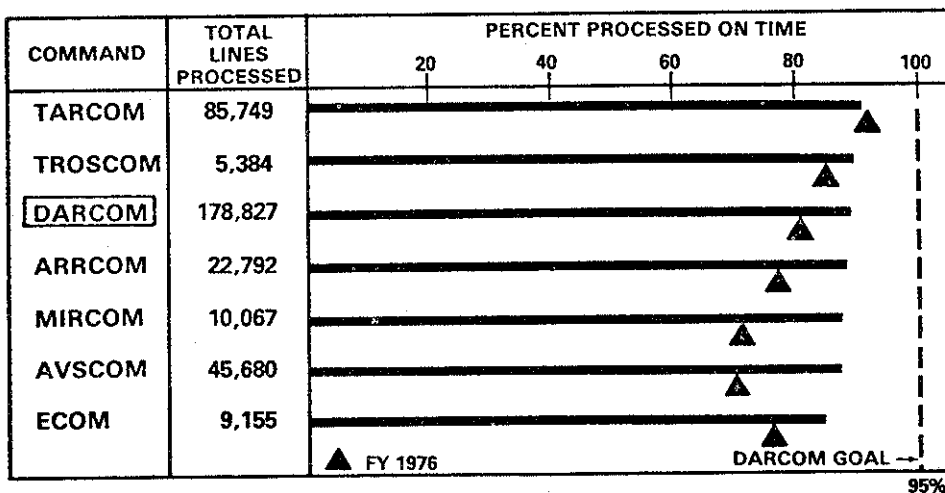
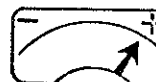
Overall DARCOM NICP performance exceeded the FY 1977 goal of 90 percent and represented a 4 percent improvement over FY 1976 performance. Except for ARRCOM, all NICP's met or exceeded the target and all but TARCOM showed improvement.

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REQUISITION PROCESSING IMMEDIATE ISSUES*

NORS
NICP (ALL IPGS)
FY 1977



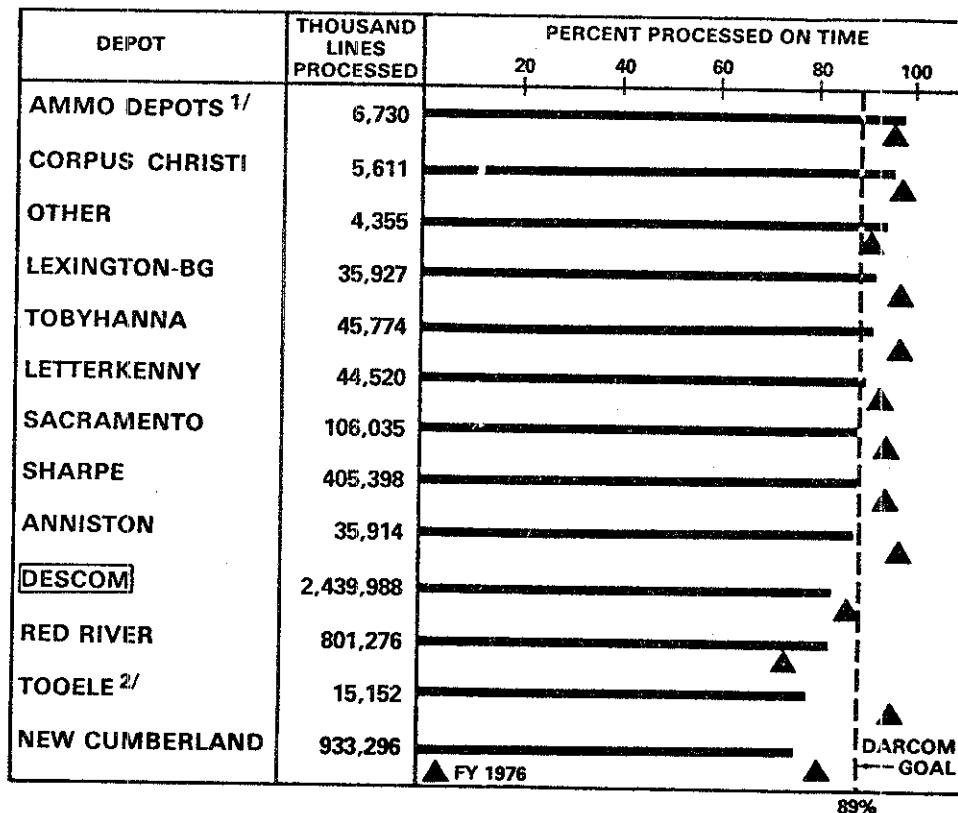
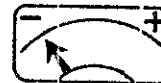
*Excludes Back Order Releases

All NICP's improved over FY 1976 except TARCOM which maintained the same level as the previous fiscal year; however, no command met the NORS 95 percent goal.

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REQUISITION PROCESSING ON TIME MROs DEPOT (ALL IPGS) FY 1977

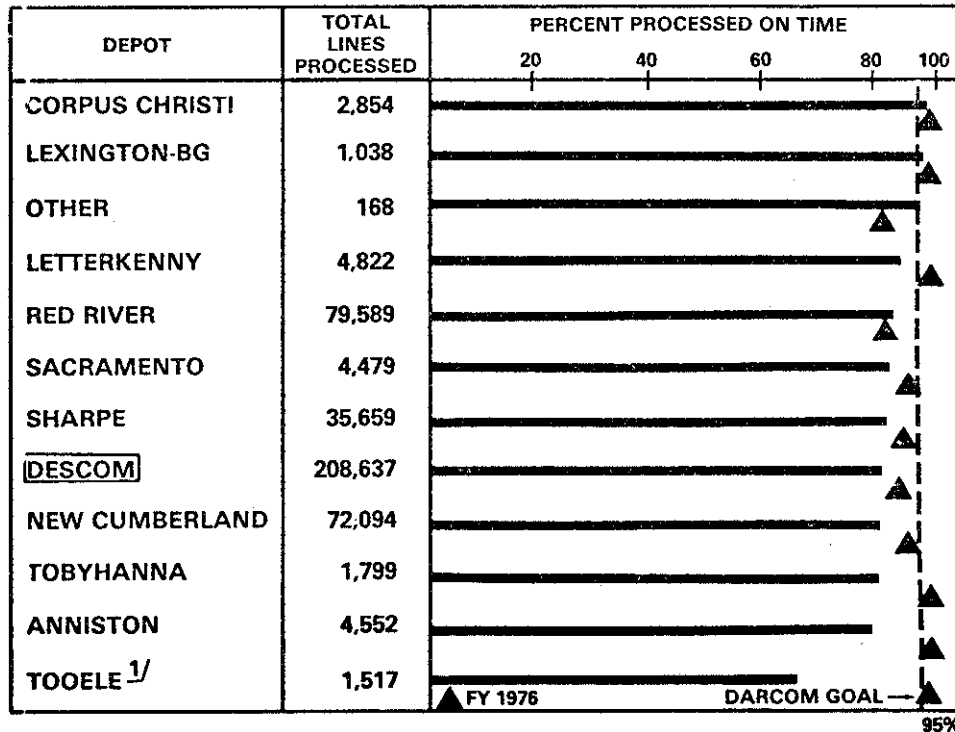
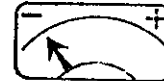


- 1/ Savanna, Seneca and Sierra
2/ Includes Pueblo and Umatilla

Overall depot on-time performance for FY 1977 failed to achieve the DARCOM goal of 89 percent or improve over FY 1977 performance because of depot fund shortage and increased workloads at the three distribution depots - Sharpe, Red River and NewCumberland. Overtime, weekend work and the use of temporary hire personnel were all curtailed to operate within funding limitations.

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REQUISITION PROCESSING NORS DEPOTS (ALL IPGS) FY 1977

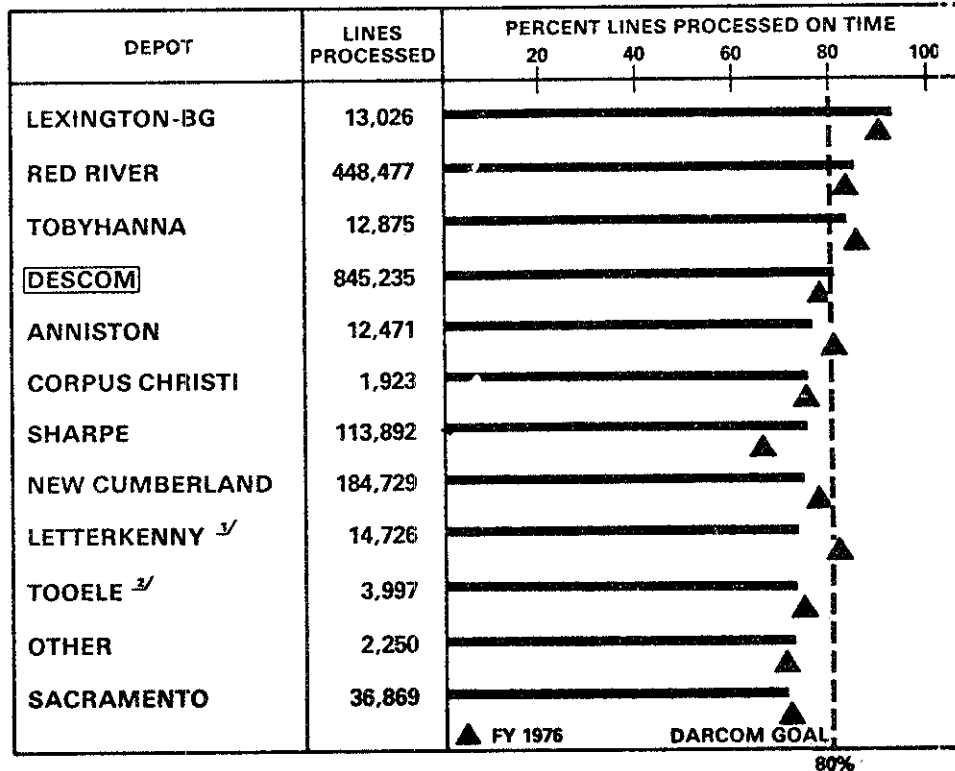
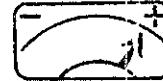


^{1/} Includes Pueblo

Overall NORS depot on-time performance also declined in FY 1977 over FY 1976 and failed to achieve the goal due to fund shortages. NORS depot standards are very tight and cannot be consistently met without overtime and significant weekend effort.

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TRANSPORTATION HOLD & IN-TRANSIT; CONUS ONLY DEPOT (ALL IPGS) FY 1977



- ^{1/} Includes Savanna
^{2/} Includes Pueblo and Umatilla

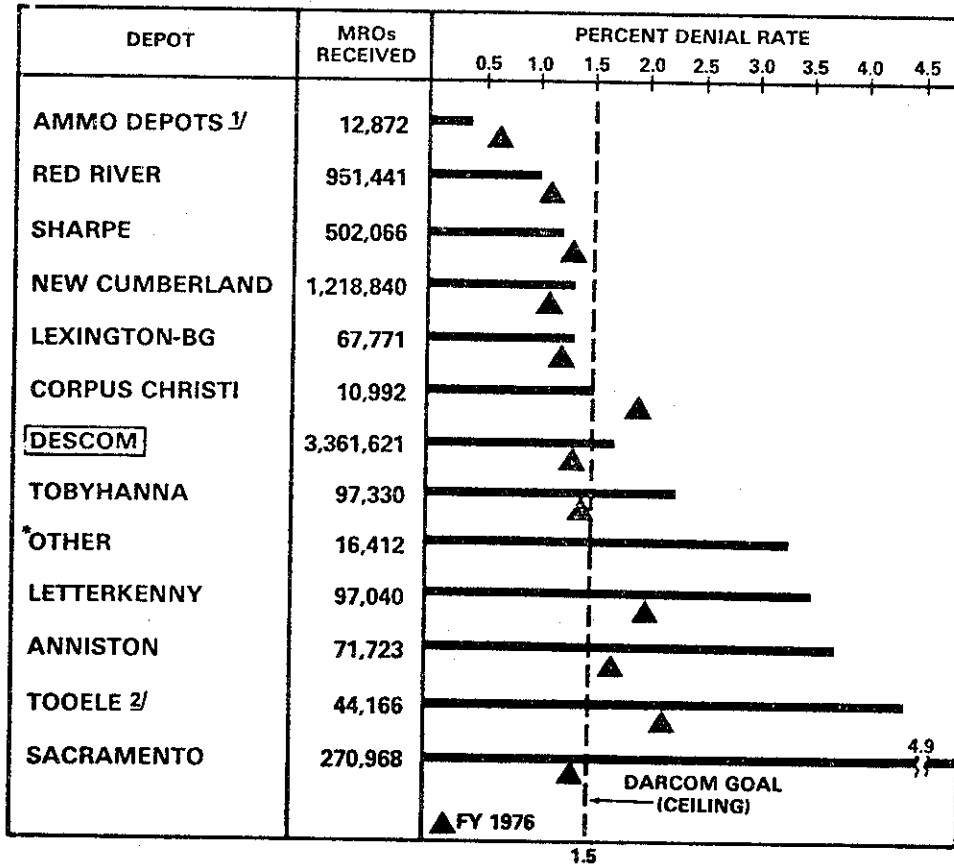
Transportation hold and in-transit time measures the time between receipt of materiel by the Transportation Office and its receipt by the customer.

Overall DARCOM performance exceeded the 80 percent goal for FY 1977 and improved over FY 1976. Of the three distribution depots, two did not meet the goal because of fund shortages. Implementation of the Secondary Item Distribution Plan has contributed to improved transportation performance by placing stock closer to the customer.

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MATERIEL RELEASE DENIALS-ARMY ONLY

FY 1977



*Information Not Available for FY 1976

^{1/} Includes Sierra, Seneca and Savanna

^{2/} Includes Pueblo, Navajo, Ft. Wingate and Umatilla

The overall DARCOM ceiling of 1.5 percent was exceeded in FY 1977 due to the turbulence in stock caused by relocation of materiel from non-distribution depots to distribution depots. All distribution depots stayed within the ceiling and improved over FY 1976 performance.

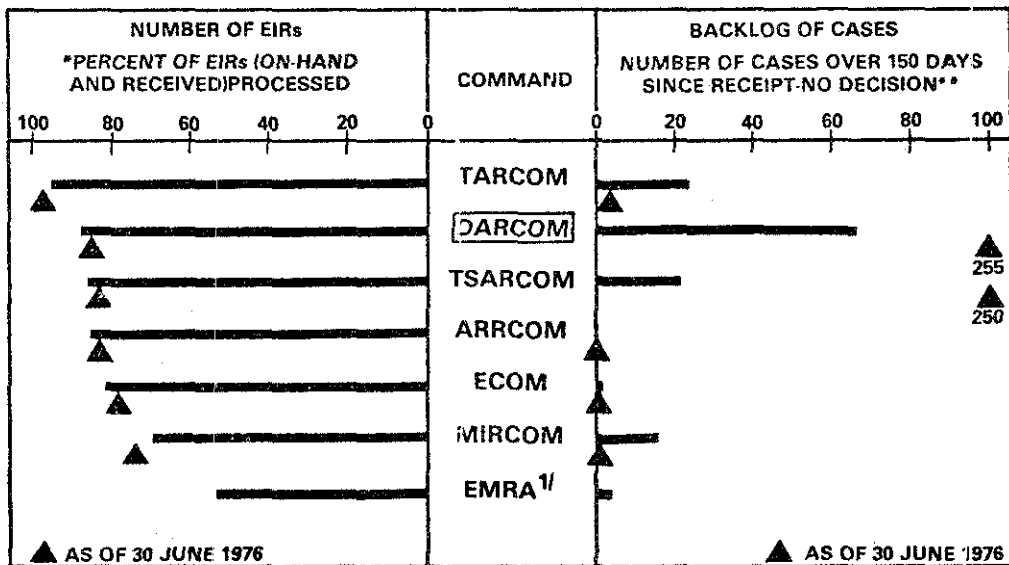
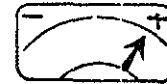
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EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

NUMBER AND CASES

FY 1977



1/ FY 1976 Data Not Available, Represents First Data Since Established.

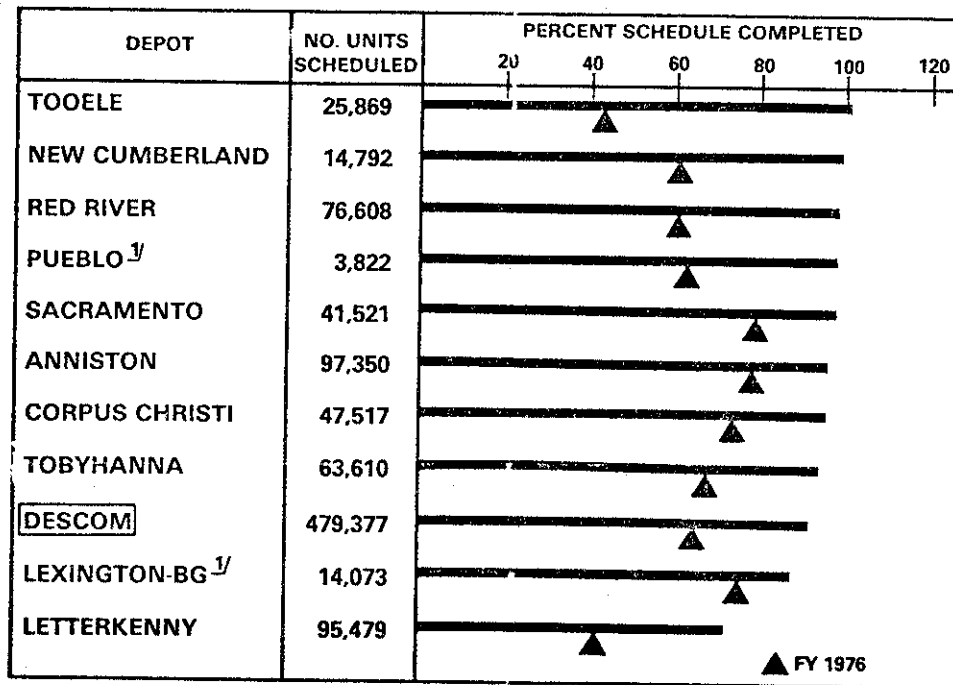
* Performance is based upon on-hand EIR, plus receipts versus completions during period.

** 150 days is the maximum allowable time by regulation for decision.

Overall, the proportions of EIR's received and processed increased: 88.5 percent in FY 1977 compared to 85.5 percent in FY 1976. The backlog of cases over 150 days old decreased dramatically from 255 cases in FY 1976 to 66 cases in FY 1977. The increase in the TARCOM backlog of cases was due to warranty EIR. This type of EIR was difficult to expedite since, once forwarded to a contractor, the decisions made might have involved litigation. The large decrease in the TSARCOM backlog was due to a positive management and computerized control of EIR. The MIRCOM increase was due to their recent reorganization. Contact with MIRCOM personnel indicated that the program was back on track. A review of the overall number of EIR's received by the DARCOM MRC's since FY 1975 indicated that the number of EIR's submitted was increasing at an average rate of 7 percent per year. In FY 1977, over 18,300 EIR's were received compared to 17,000 in FY 1976.

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DEPOT LEVEL MAINTENANCE PROGRAM
% OF UNITS COMPLETED
FY 1977



^{1/} Depot Being Phased Down

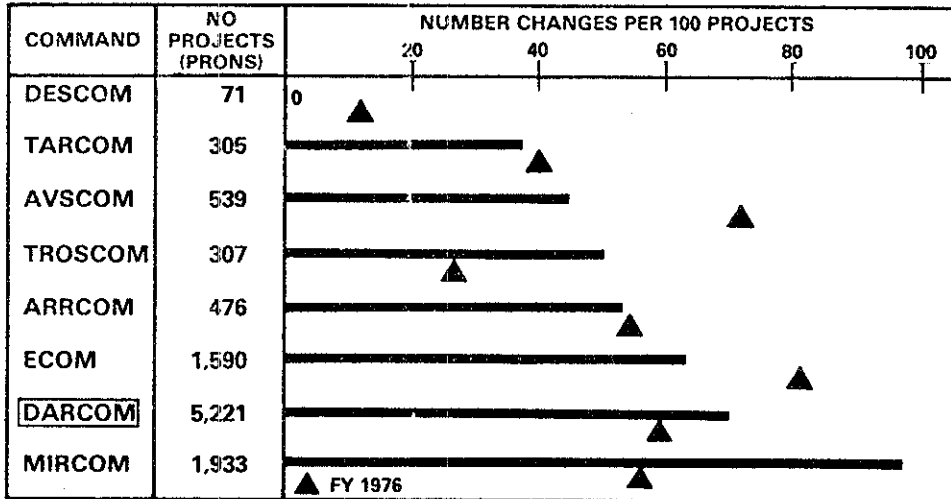
These items were high visibility command emphasis items selected by DARCOM, representing 60 to 80 percent of the total dollar value of the maintenance program and are used to determine the efficiency and effectiveness of depot maintenance operations.

All depots' performance improved when compared with FY 1976 workload accomplishment. Mission realignment significantly affected depot maintenance performance in FY 1976; however, these actions were stabilized in FY 1977. Some additional workload adjustments are anticipated for FY 1978.

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DEPOT MAINTENANCE PROGRAM CHANGES FY 1976 VS FY 1977

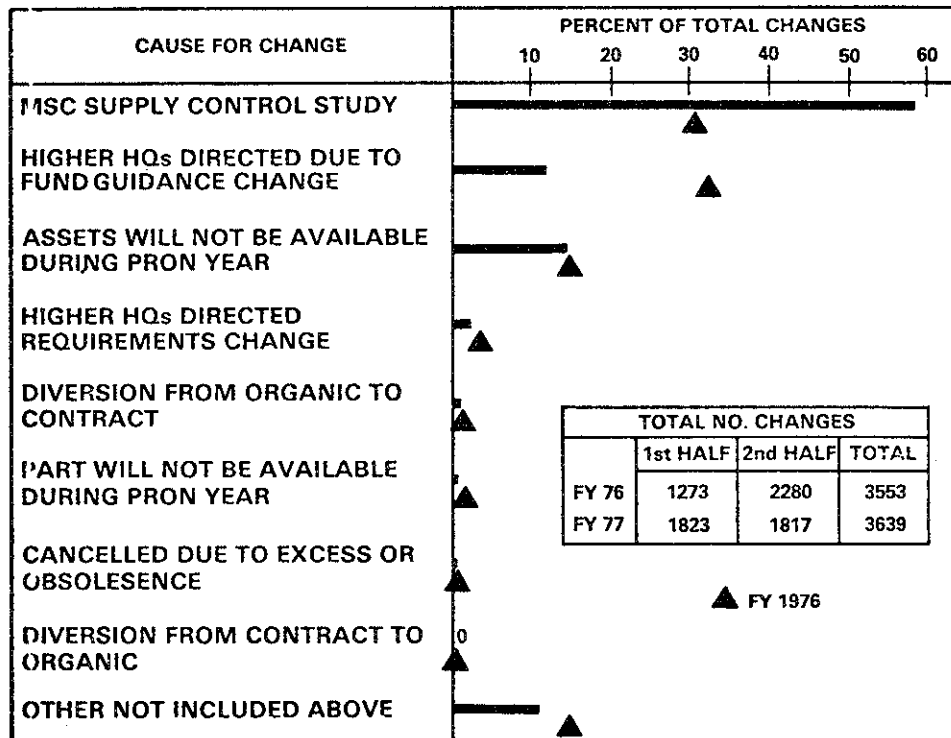


PRONS: Procurement Request Order Number

In comparison with FY 1976, total DARCOM maintenance program changes per 100 PRONS increased 10.1 percent (59.6 percent vs 69.7 percent). Goals for policing depot maintenance program changes were dropped which contributed to the escalation of changes. Primary causes for program changes are shown on the next chart.

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DEPOT MAINTENANCE PROGRAM CAUSES FOR CHANGES FY 1977



The total number of depot maintenance program changes for FY 1977 reflected an increase in the number of changes over FY 1976. Primary cause for change continued to be MSC supply control studies. Higher headquarters directed due to fund guidance change and non-availability of assets were additional contributing factors for increased changes.

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Procurement and Production

(U) The DARCOM Procurement Management Systems (PROM) was initiated on 4 March 1976. This new system was designed to focus on primary objectives and was to ultimately streamline data and reporting requirements. PROMS provided for maximum participation of DARCOM activities in the establishment of procurement objectives. It provided meaningful and timely information to top management with prompt feedback to the MSC's.

(U) The DOD Cost/Schedule Control Systems Criteria (C/SCSC) was a highly successful tool for enhancing DARCOM's capability for better cost control on the major development and production contracts. C/SCSC permitted contractors to use the specific management procedures of their choice but required that these procedures have the characteristics, capabilities, and disciplines necessary for effective cost and schedule control. During the first half of this fiscal year, DARCOM completed the full series of in-plant reviews leading to the acceptance of the management control systems of seven contractors (including four Army ammunition plants). In addition, seven more applications of C/SCSC were given "Subsequent Application Reviews" and accepted on new contracts at plants with previously accepted management control systems. After conducting the complete initial series of C/SCSC reviews, 49 implementations of C/SCSC were found acceptable. Of these, seven were at Army ammunition plants and six at in-house activities. In 30 additional situations, C/SCSC applications were found acceptable on a new contract or program at a facility which already had an acceptable management control system. In process were 29 additional applications.












(U) By implementing Review of Army Mobilization Planning (RAMP) recommendations to strengthen and clarify policy and guidance, DARCOM improved the management of the industrial base. Also, it was improved by realigning the schedule of planning activities to provide maximum impact and planning information during POM preparation; and by continuing implementation of a comprehensive industrial plant equipment assessment, and refurbishing program.

(U) Charts. Procurement Production performance is shown below.

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CONTRACT AWARDS
(COMBINED ARMY AND REIMBURSABLE)
APA
% AWARD VS DARCOM OBJECTIVE
AS OF 30 SEPTEMBER 1977

| COMMANDS | FY 1977 PROGRAM (\$MILLIONS) | | PERCENT ACHIEVED IN MEETING DARCOM OBJECTIVE | | | | | |
|--------------------------|------------------------------|---------------------------|--|----|----|----|-----|-----|
| | TOTAL RELEASED PROGRAM | DARCOM ADJUSTED OBJECTIVE | 20 | 40 | 60 | 80 | 100 | 120 |
| ARRADCOM | 224.3 | 169.7 |  | | | | | |
| MIRADCOM | 79.4 | 61.1 |  | | | | | |
| ARRCOM | 2,034.2 | 1,577.3 |  | | | | | |
| DARCOM | 6,989.5 | 5,604.4 |  | | | | | |
| TARCOM | 1,853.1 | 1,549.3 |  | | | | | |
| MIRCOM | 966.2 | 858.2 |  | | | | | |
| TSARCOM (AVSCOM) | 649.2 | 511.3 |  | | | | | |
| CERCOM | 759.7 | 516.9 |  | | | | | |
| TARADCOM | 125.2 | 111.1 |  | | | | | |
| TSARCOM (TROSCOM) | 216.4 | 179.2 |  | | | | | |
| TECOM, HDL, AMMRC., ETC. | 81.8 | 70.3 |  | | | | | |

NOTE: Due to Reorganization and Establishment of Dollar Objective, Comparative Data is Not Available for FY 1976.

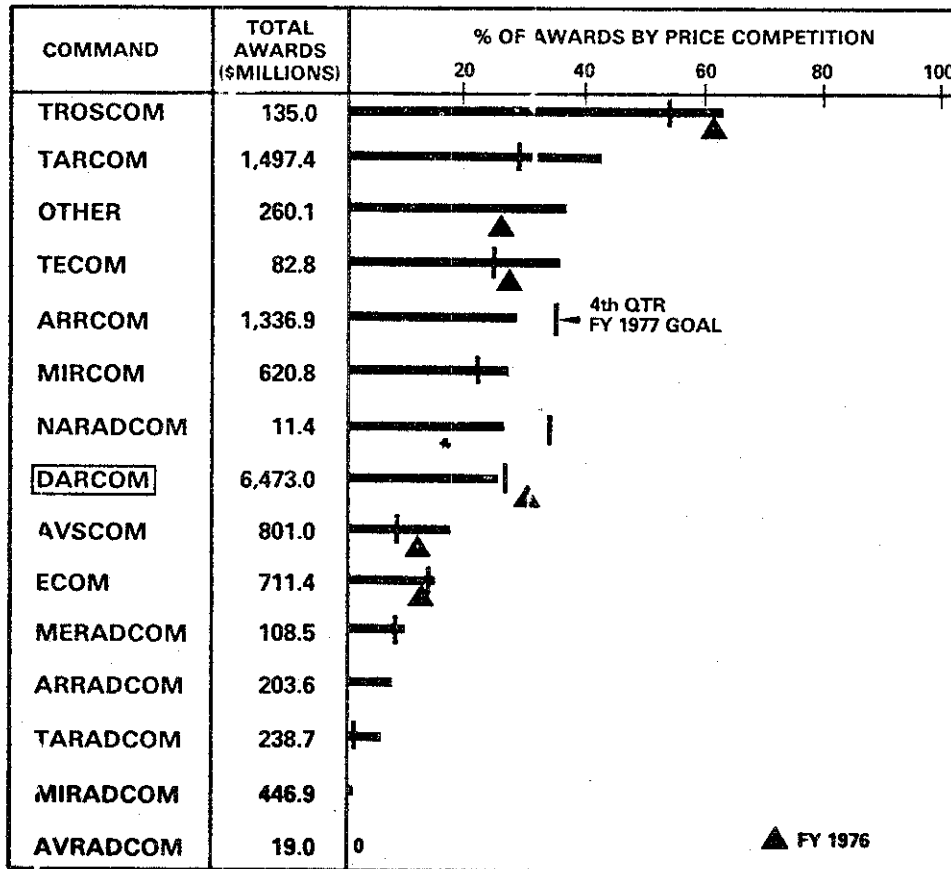
DARCOM established a dollar award objective of \$5,715.8 million which was adjusted (less non-actionable) to \$5,604.4 million for FY 1977. The overall award command performance exceeded the DARCOM objective by \$110.6 million for a performance of 102.0 percent.

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APA CONTRACT AWARDS PRICE COMPETITION

FY 1977

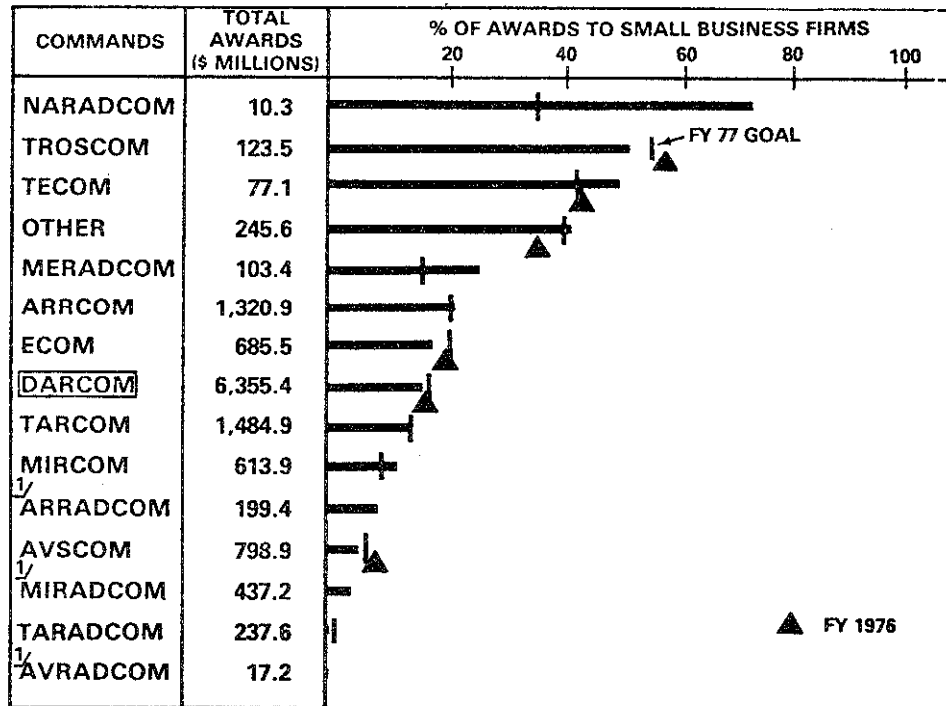
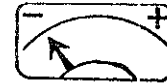


NOTE: Due to Reorganization, FY 1976 Information is Not Available for New Commands.

Overall DARCOM fell short of performance goal of 27 percent by 1.2 percent. Price competition was not met due primarily to ARRCOM over estimating competitive procurements at Frankford and Picatinny. Previously planned competitive procurements for \$39 million and \$32 million respectively for plant modernization equipment was changed by allocating to prime contractors for sub-contracting.

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APA CONTRACT AWARDS SMALL BUSINESS AWARDS FY 1977



1/ Goal Not Assigned

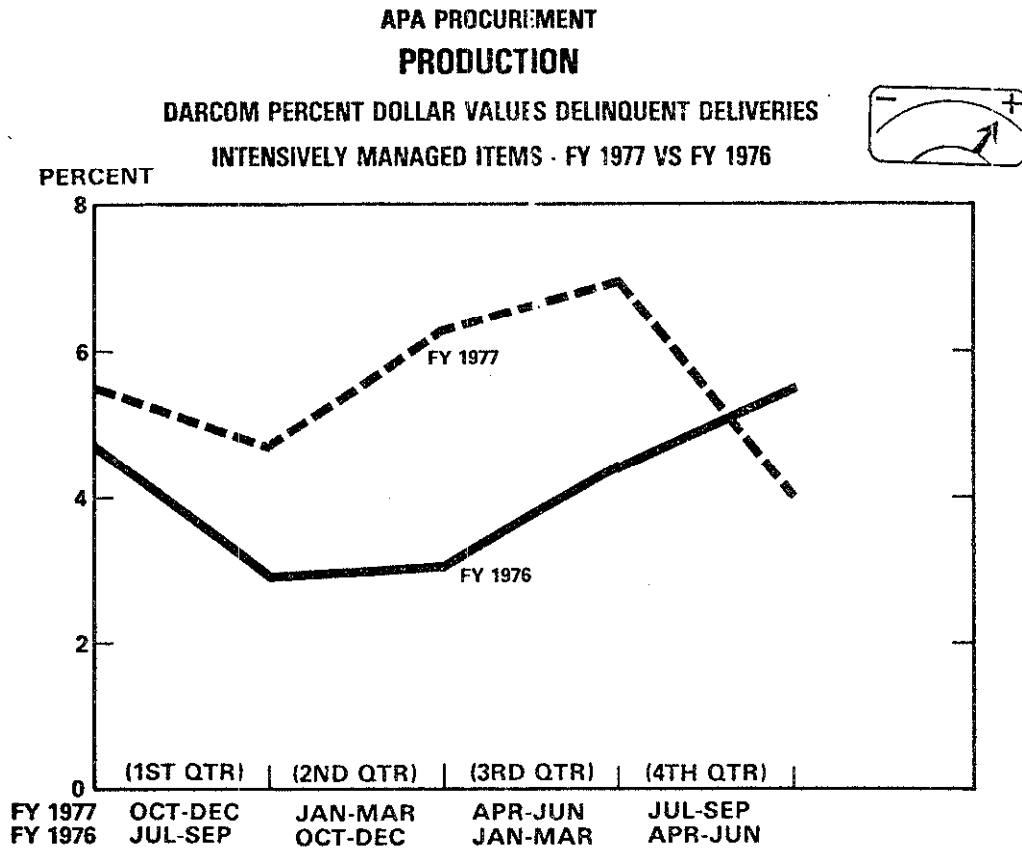
NOTE: Due to Reorganization, FY 1976 Information Was Not Available for New Commands.

DARCOM performance of 16.3 percent fell short of its year end goal of 18.2 percent. DA and DOD imposed the 18.2 percent goal in lieu of an 15.8 percent DARCOM goal in order to offset the proposed Air Force procurement in FY 1977 for the B1 Bomber.

Half of the commands, with assigned goals, met or exceeded their goals with NARADCOM showing the best performance against its goals.

Commanders were urged to be personally concerned about this program and assure that small business offices were adequately staffed and postured to give authority to the program. DARCOM's Special Assistant for Small Business issued several guidance letters to commands on this point since July 1977.

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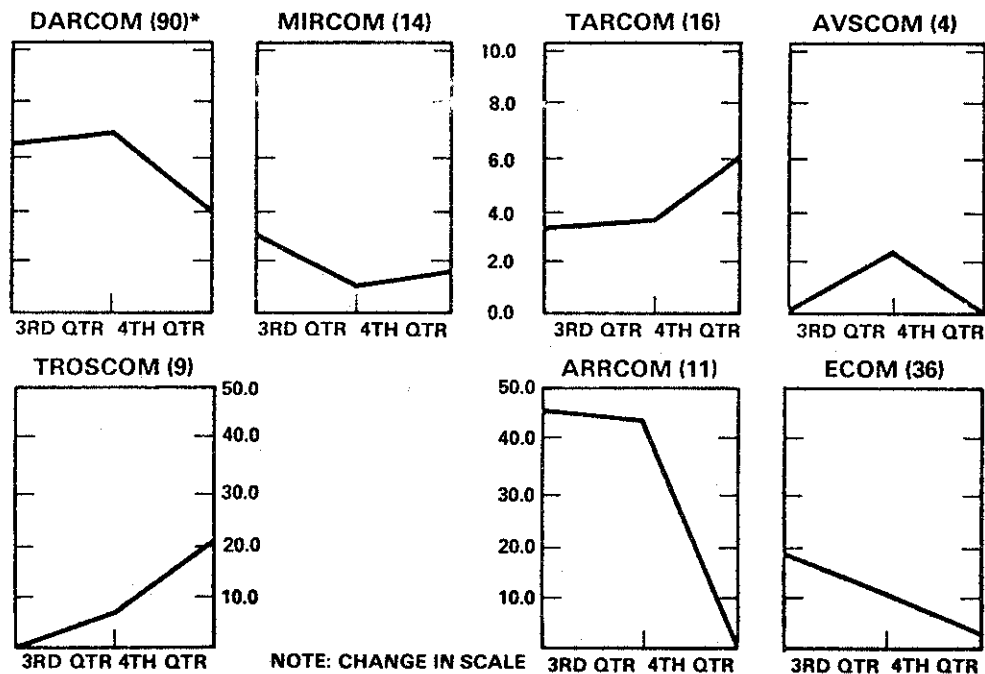
Total value of contracts as of 30 September 1977 was \$3.3 billion of which \$1.9 billion was the scheduled value of deliveries. Actual deliveries as of 30 September 1977 totaled \$1.8 billion reflecting a delinquent rate of 4.0 percent as compared with the FY 1976 rate of 5.5 percent. Items representing the bulk of dollars delinquent are shown on the next chart.

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PRODUCTION PERCENT DOLLAR VALUES DELINQUENT DELIVERIES

SECOND HALF FY 1977
% DELINQUENT



*Number of Intensely Managed Items in Production as of 30 September 1977.

Overall, the percent of dollar delinquencies decreased from 6.3 percent 4.0 percent. With the exception of AVSCOM, ARRCOM and ECOM, all commands reported increased trends. Reason for increase of delinquencies was due to: (1) Production problems; (2) Contractor financial condition; (3) Fire; (4) Strike.

Items representing the bulk of dollars are as follows:

| <u>ECOM</u> | | <u>TROSCOM</u> | |
|--------------------------|--------|-----------------------------|---------|
| AN/PP-5 Radar | \$.8 | Landing Craft | \$ 4.1 |
| RT 524 Receiver | \$1.3 | Shelter Air Inflatable | \$ 2.9 |
| TA 838 Telephone | \$1.1 | <u>TARCOM</u> | |
| <u>MIRCOM</u> | | Tank Combat FT, 105mm Gun | \$ 0.25 |
| Chaparral Guided Missile | \$4.96 | M60 Series | \$36.9 |
| Hawk Missile | \$.98 | Semi-Trailer Van Electronic | \$ 6.9 |
| AN/MPQ-49 FAAR Radar | \$1.88 | M373A2 | |
| Dragon Missile Launcher | | Truck 1½ Ton M880 Series | \$10.76 |
| | | Truck 5 Ton M809 Series | \$ 3.8 |
| | | Grader Road MTZD | \$ 0.34 |

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Plans, Doctrine, and Systems

(U) The DARCOM Readiness Evaluation System (DRES) was approved in November 1976 and implemented in June 1977. This concept gave DARCOM the ability to assess the ability of the Readiness Commands, Depots, and other field activities to respond to planned operational requirements. It was to provide a basis for evaluating command-wide readiness conditions and trends, identify readiness problems which required resolution, provide information which could be used to support requests for resources, and more clearly document and support future requirements.

(U) Phase I of the Total Army Equipment Distribution Plan (TAEDP) was operational and continued to be exercised in support of DA Staff requirements. After its completion in June 1976, this phase of the total effort was dedicated to the development of an interim system to support the FY 78-82 POM formulation process. The Phase I system had the capability to logically project the distribution of equipment available through the funded delivery period of the last year of the POM. Also, it could assess the impact of proposed changes using as variables: changes to the force structure, priorities within the force, and assets available for distribution within a given period of time. This system could provide output displays of Line Item Number (LIN) as well as Standard Study Number (SSN) level. The displays could reflect data in a number of claimant stratifications such as major command level, force group level, and if required, separate displays for separate divisions, brigades and battalions.

International Logistics

(U) After identifying a need for clarifying the DOD and Army pricing policy, DARCOM developed and presented a pricing symposium. It gathered the top levels of management (i.e., the Comptroller and Directors of IL, Materiel Management and Procurement) in each of the major subordinate commands and brought them face-to-face with policy makers at OSD, DA, and DARCOM. The result of this symposium was the positive identification of a need to clarify and, where necessary, reevaluate the validity of our pricing policy as it pertained to security assistance. OSD and DA initiated actions which resulted in the adoption of the most significant proposals which evolved from the symposium.

(U) On 9 September 1976, the Deputy Secretary of Defense approved the centralization of Foreign Military Sales billing, cost collection, trust fund accounting and administrative fee management. The Air Force was designated the DOD Executive Agent. Establishment of a single DOD system eliminated individual service-operated accounting and billing systems. The centralized operation was to be performed

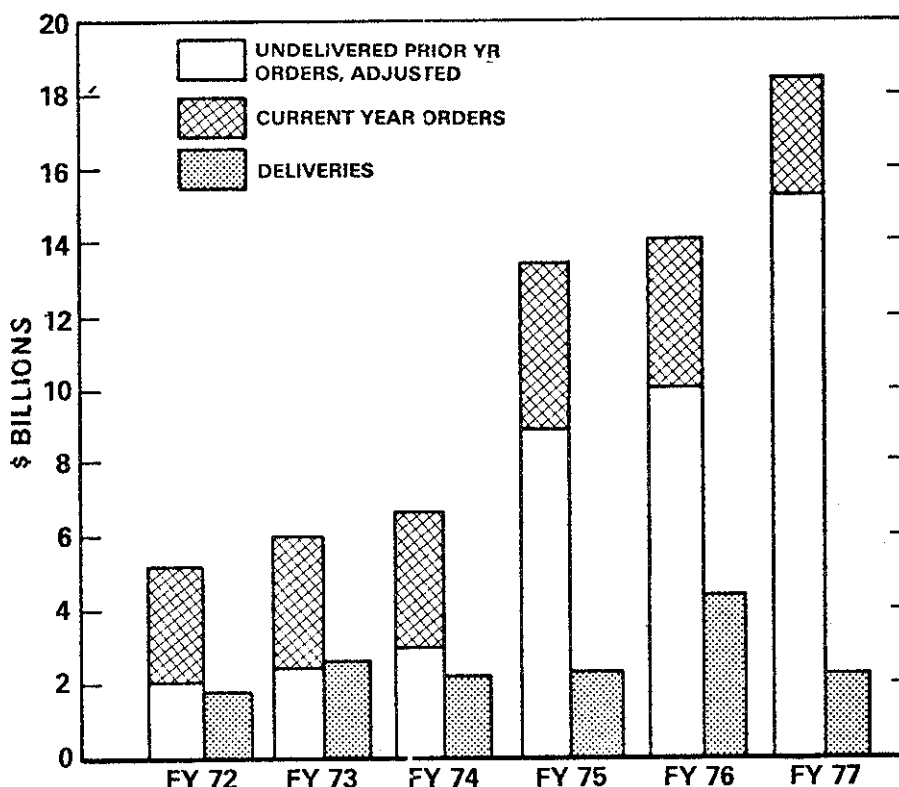
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by the Security Assistance Accounting Center (SAAC) at Denver, Colorado. On 20 November 1976 the responsibility and related records pertaining to Foreign Military Sales trust fund accounting, billing, cash collection, and administrative fee management for Israel, Iran, and Saudi Arabia were transferred from USAILCOM to SAAC. The remaining countries were transferred by June 1977.

(U) Charts. The performance of DARCOM in the security assistance area is shown below.

DARCOM SECURITY ASSISTANCE ORDERS AND DELIVERIES FY 1972 THROUGH FY 1977



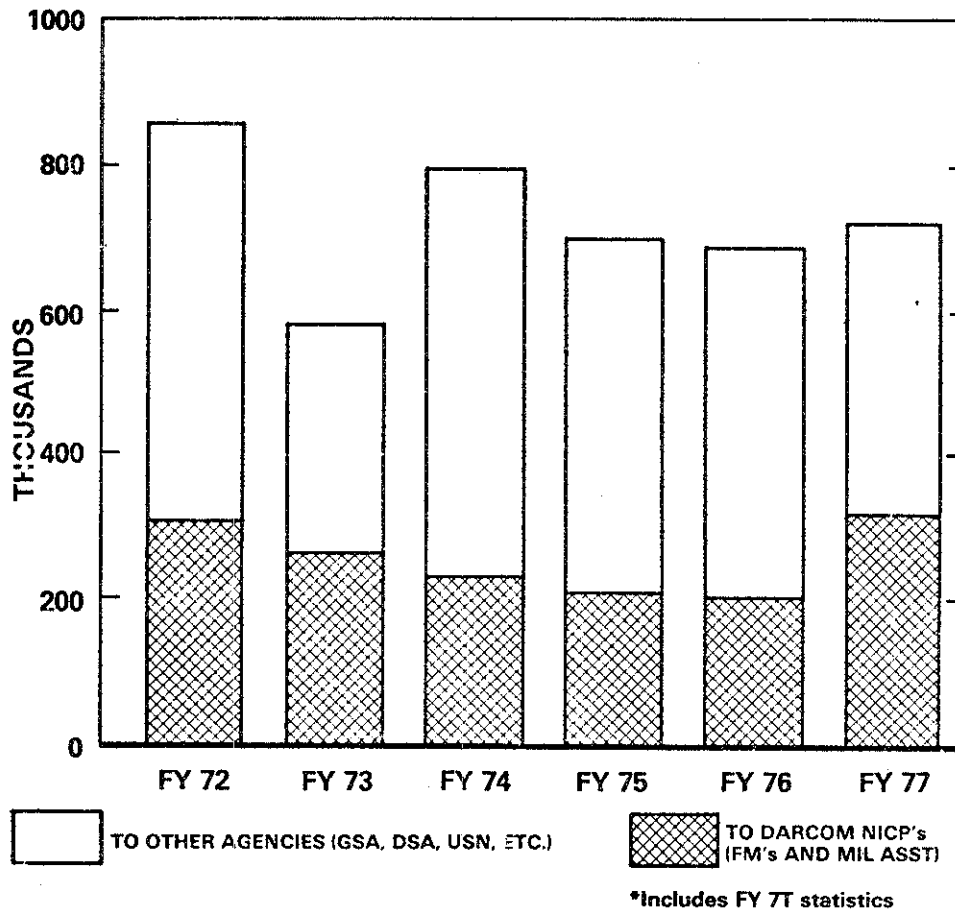
The undelivered orders at the end of FY 1977 show an increase of \$1.3 billion over the undelivered orders at the beginning of the fiscal year. This increase was attributable to \$4.3 billion in new orders received during FY 1977. The major portion of the undelivered orders were for the following customers:

Saudi Arabia - \$8.7 billion which includes \$7.2 billion for construction of facilities under the control of the Corps of Engineers.

Iran - \$3.0 billion which includes \$1.1 billion for maintenance of equipment and \$1.9 billion for aircraft and parts, missiles, ammo and other equipment.

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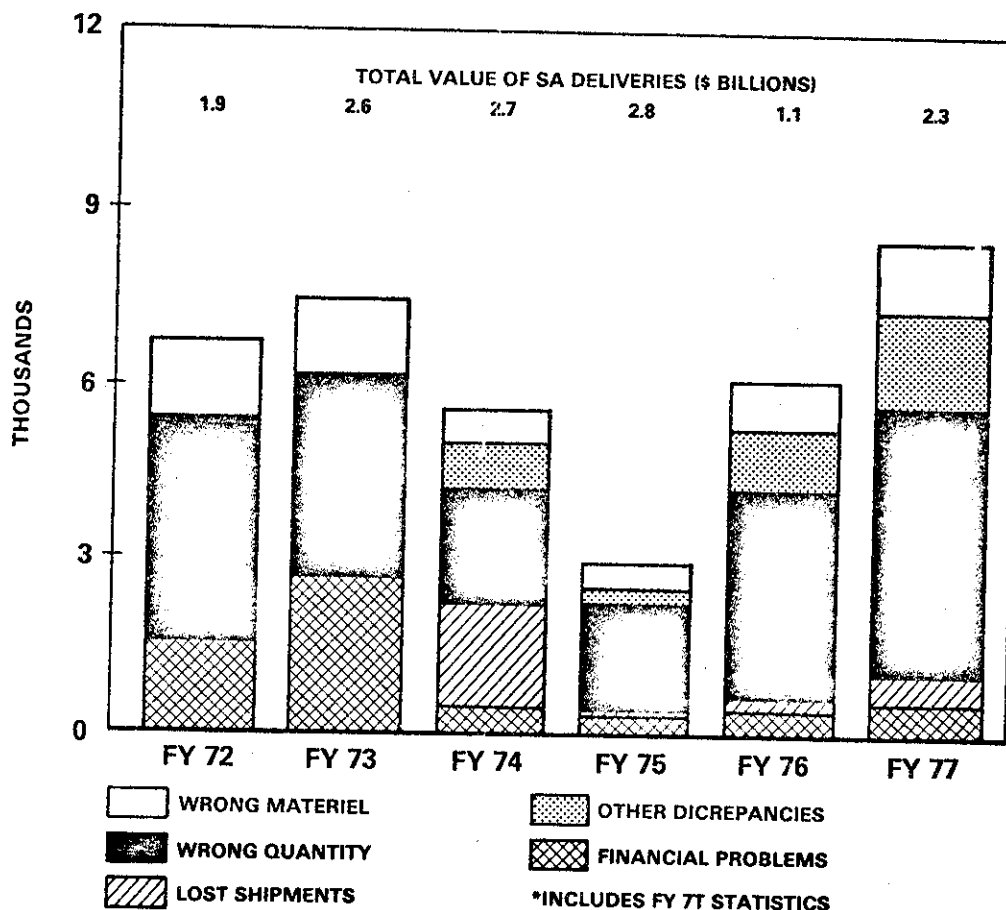
DARCOM SECURITY ASSISTANCE REQUISITIONING/DEMAND ACTIVITY NICP's COMPARED WITH OTHER AGENCIES FY 1972 THROUGH FY 1977*



Requisitions received against the Security Assistance Program for FY 1977 increased by approximately 30 thousand requisitions as compared to FY 1976 and is attributable to the inclusion of FY 197T in these statistics.

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DARCOM SECURITY ASSISTANCE
REPORTED DISCREPANCIES BY TYPE
FY 1972 THROUGH FY 1977*



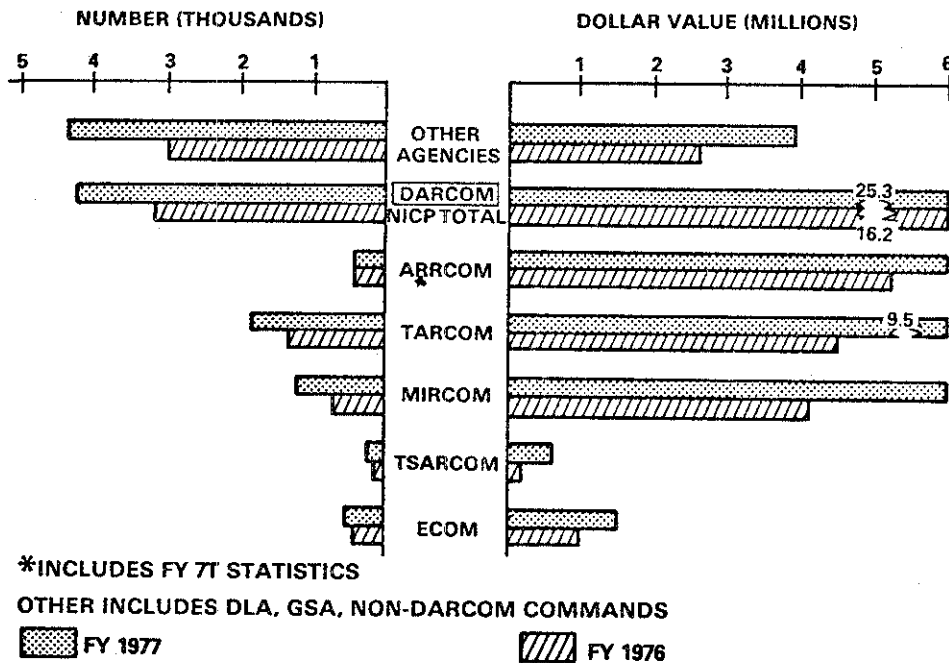
The number of reported discrepancies for the FY 1977 reflects an increase of 2,417 ROID's (Report of item discrepancy) over FY 1976. This increase can be attributed to the increase in Security Assistance Programs during the FY 1975, FY 1976 and FY 1977 timeframe which has resulted in shipments during this period as well as the inclusion of FY 1977T data in FY 1977 statistics.

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DARCOM SECURITY ASSISTANCE
REPORTED DISCREPANCIES
NUMBER/DOLLAR VALUE

FY 1976 - FY 1977*



An increase in the number of customer item discrepancy reports was reflected at most of the commands and an increase in the dollar value of discrepancy reports was reflected at all commands in FY 1977 as compared to FY 1976.

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DARCOM SECURITY ASSISTANCE REPORTED DISCREPANCIES VALUE BY NICP AND SELECTED COUNTRIES (DOLLAR THOUSANDS) FY 1977*

| COUNTRY | TOTAL | ARRCOM | ECOM | MIRCOM | TARCOM | TSARCOM |
|--------------|----------|---------|---------|---------|---------|---------|
| ISRAEL | \$8,498 | 2,474 | 197 | 478 | 5,188 | 161 |
| GERMANY | 4,974 | 1,068 | 80 | 1,291 | 2,533 | 2 |
| ITALY | 1,804 | 77 | 18 | 1,251 | 448 | 10 |
| VENEZUELA | 1,194 | 1,194 | 0 | 0 | 0 | 0 |
| KOREA | 1,579 | 441 | 68 | 882 | 176 | 12 |
| NAMSO (N4)** | 1,223 | 9 | 170 | 1,030 | 8 | 6 |
| JORDAN | 863 | 144 | 391 | 80 | 237 | 11 |
| CHINA | 726 | 397 | 98 | 137 | 36 | 58 |
| JAPAN | 638 | 2 | 12 | 621 | 2 | 1 |
| AUSTRALIA | 334 | 0 | 240 | 0 | 0 | 94 |
| NORWAY | 65 | 0 | 45 | 0 | 20 | 0 |
| AUSTRIA | 10 | 3 | 1 | 0 | 6 | 0 |
| TOTALS | \$21,908 | \$5,809 | \$1,320 | \$5,770 | \$8,654 | \$ 355 |
| OTHER | 3,489 | | | | | |
| GRAND TOTAL | \$25,397 | | | | | |

53 Other customers who reported item discrepancies and dollar value of each:

| | | | | | |
|-------------|-----------|-------------|-----------|------------------|------------------|
| ARGENTINA | \$ 95,954 | INDONESIA | \$ 4,272 | PARAGUAY | \$ 14,968 |
| AUSTRALIA | 423,786 | IRAN | 303,059 | PERU | 27,534 |
| AUSTRIA | 1,081,191 | ISRAEL | 8,781,529 | PHILIPPINES | 2,041 |
| BELGIUM | 60,875 | ITALY | 1,831,007 | PORTUGAL | 268 |
| BOLIVIA | 10,062 | JAPAN | 720,580 | SAUDI ARABIA | 32,845 |
| BRAZIL | 1,483 | JORDAN | 1,009,314 | SAUDI ARABIA(NG) | 117 |
| BURMA | 216 | KOREA | 1,917,502 | SHAPE | 385 |
| CANADA | 287,296 | KUWAIT | 218,369 | SINGAPORE | 35,059 |
| CHINA | 1,575,218 | MOROCCO | 8,444 | SPAIN | 134,426 |
| COLUMBIA | 25,102 | NAMSO(N4) | 1,414,023 | SWEDEN | 5,054 |
| CONGO | 6 | NATO(N7) | 139,426 | SWITZERLAND | 48,933 |
| DENMARK | 44,094 | NATO(N9) | 441 | THAILAND | 32,822 |
| EL SALVADOR | 3,904 | NETHERLANDS | 223,014 | TUNISIA | 81 |
| ETHIOPIA | 53,524 | NEW ZEALAND | 24,851 | TURKEY | 92,354 |
| GERMANY | 6,699,961 | NORWAY | 236,332 | UNITED KINGDOM | 176,060 |
| GREECE | 5,185 | NICARAGUA | 51,144 | URAGUAY | 1,115 |
| GUATEMALA | 8,073 | PAKISTAN | 53,970 | VENEZUELA | 1,273,221 |
| INDIA | 514 | PANAMA | 24,039 | YUGOSLAVIA | 19,062 |
| TOTAL | | | | | \$29,234,105 *** |
| GRAND TOTAL | | | | | \$29,259,502 |

* Includes FY 77 Statistics
** NATO Maintenance and Supply Organization
*** Includes Other Agencies

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Financial Management

(U) The growth of Foreign Military Sales generated excessive demands on Army Appropriations which caused the Treasury Accounts to be overdrawn. Decisive action was taken by the DARCOM Comptroller to remedy the situation. He initiated a vigorous program to secure cash advances from the FMS Trust Fund based on projected cash demands to finance procurement being executed for FMS customers. These funds not only eliminated most of the deficit in APA cash balances, but provided necessary cash to finance progress payments made to contractors. In addition, DARCOM initiated a program to review FMS case payment schedules to the end that adequate resources in the form of cash deposits were timely and adequate.

(U) DARCOM, in coordination with TRADOC and COA, examined the mutual problem of responding to the complex demands for cost estimates used in Cost and Operational Effectiveness Analyses (COEA) supporting the weapon system decision making process. This cooperative effort resulted in the establishment of policy and procedures for improved control of Army COEA's. A joint TRADOC/DARCOM Guide for COEA Cost Data subsequently was abolished and disseminated widely within the Army for implementation of the improved approach. The new procedures were being applied successfully to COEA study efforts as they were initiated.

(U) In the continuing effort to improve DARCOM's financial management, the formula used to reallocate the AIF monies was critically examined. Every month, the immediate requirements of all depots, laboratories and other AIF activities were reviewed and the available cash was allocated between them according to their need. The cost analysts reviewed the methodology and reconstructed a new and improved formula. It was put in effect on 1 October 1976.

(U) The productivity index numbers continued to reflect better input-output relations in this period than in the base year of FY 1972. In addition, the commodity commands improved their indices in the base operations, supply, and maintenance activities, while the depot base operations index also rose during the year. Depot supply productivity was still significantly higher than it was in FY 1972.

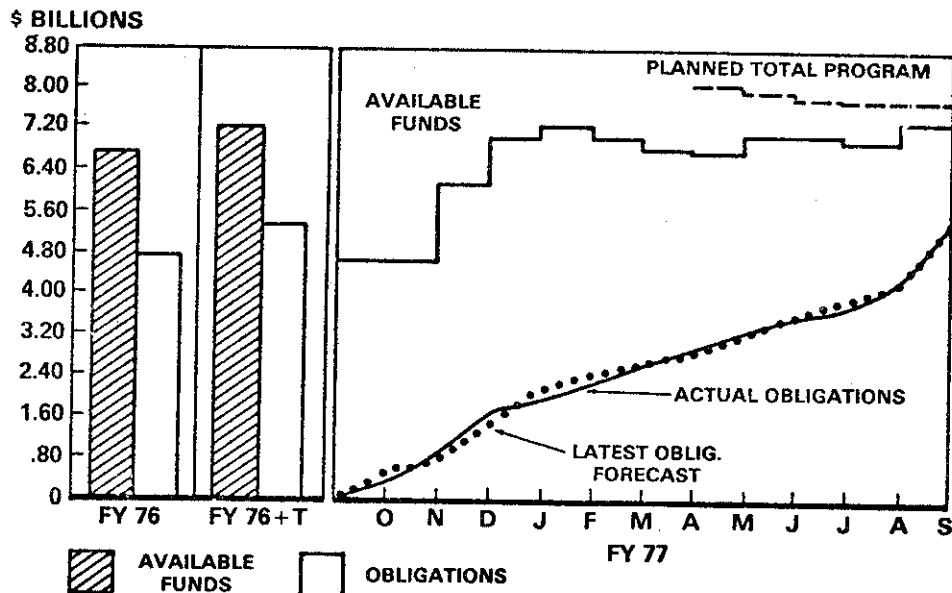
(U) Charts. The funding programs for FY 1977 follow.

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FINANCIAL MANAGEMENT - APA APPROPRIATION

TOTAL DARCOM - FY 73-77 FUNDS



The DARCOM procurement program shown includes funds carried over from FY 1973 thru FY 197T as well as those appropriated for FY 1977.

This is DARCOM's largest single program, comprising about 62 percent of the total. At the close of FY 1979, DARCOM received funds to cover 94 percent of the planned total program and obligated some 72 percent of the total funds available.

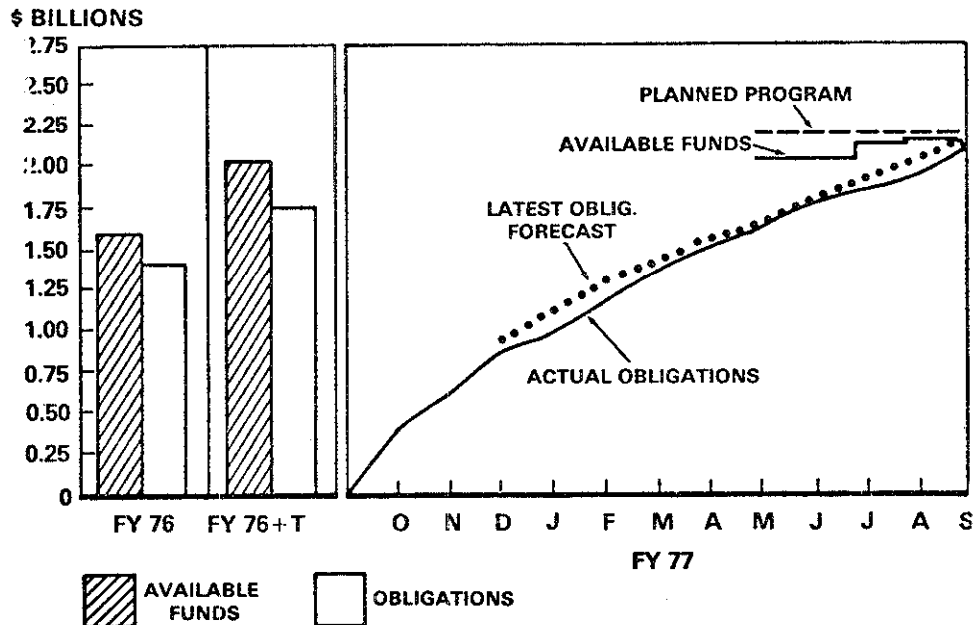
The left side of the chart, for comparison purposes, shows the available funds and actual obligations for FY 1976 and 1976 plus the T period. Obligations were slightly higher this year than they were for FY 1976 plus the T period and the percentage of available funds obligated was just about the same (72 percent this year vs 71 percent in FY 1976 plus 197T period).

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FINANCIAL MANAGEMENT - RDTEA APPROPRIATION

TOTAL DARCOM - FY 77 FUNDS



This chart includes all funds, direct and customer as one total.

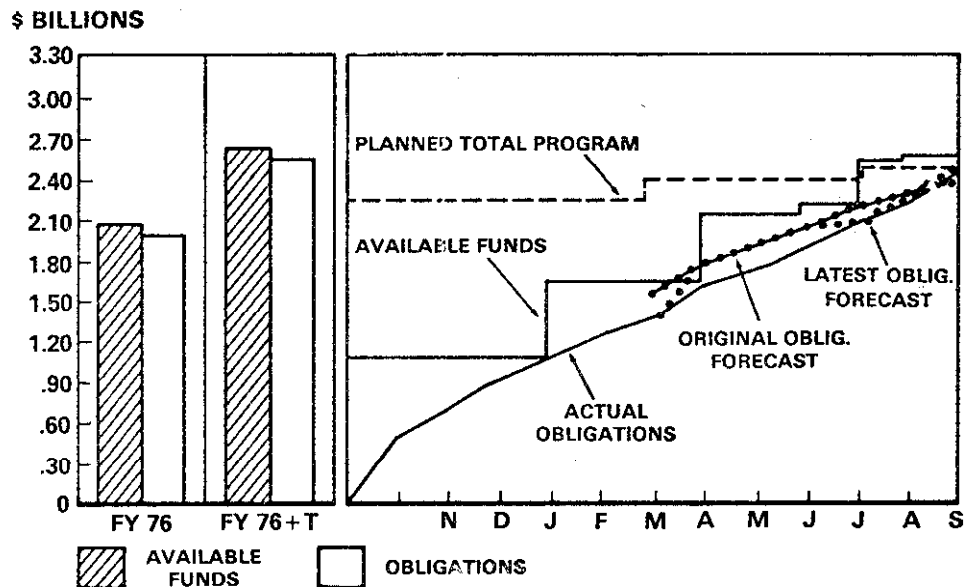
As of the end of the fiscal year DARCOM received sufficient funds (both in carry over from the 197T period and FY 1977 appropriation) to cover 98 percent of the planned total program and had obligated 98 percent of this amount. This was a significant improvement over the 87 percent of available funds obligated during the FY 1976 plus 197T period.

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FINANCIAL MANAGEMENT - OMA APPROPRIATION

TOTAL DARCOM - FY 77 FUNDS



The year-end data on this chart include both direct and reimbursable OMA funds.

In direct OMA, DARCOM obligated \$1.97 billion of \$1.98 available, leaving an unobligated balance of \$11.7 million, or 0.6 percent.

Reimbursable program available was \$.55 billion, of which \$.49 billion or 89 percent was obligated, leaving an unobligated balance of approximately \$60 million.

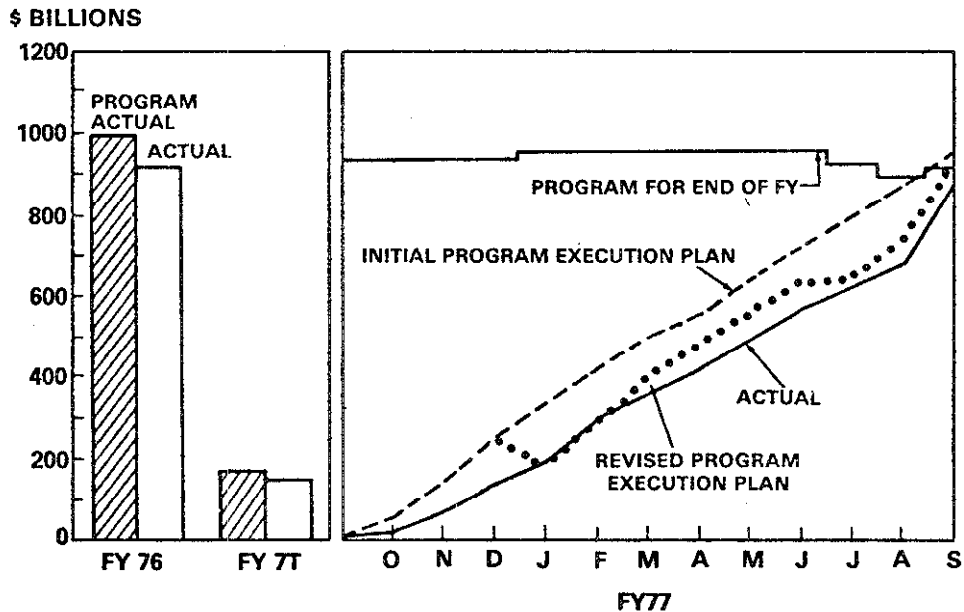
Thus, only about one-sixth of DARCOM's unobligated balance was in directly funded OMA programs.

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FINANCIAL MANAGEMENT - WHOLESALE ASF OBLIGATIONS

TOTAL DARCOM - FY 77



DARCOM began FY 1977 with a program to obligate \$929 million ending with a program of \$893 million.

The initial Monthly Execution Plan was to reach \$929 million while the revised program which was in effect at the time actual monthly obligations were reported, was to reach \$893 million or 4 percent below the revised program. Of the \$40 million shortfall, \$26 million were in MAP/MOB categories of materiel, including \$20 million for clothing and textiles.

Readiness commands' shortfalls totaled \$14 million, or 1.7 percent of their revised program, with the shortfalls ranging from 0.1 percent at ARRCOM to 3.6 percent at TSARCOM. Overall, the FY 1977 obligation shortfall of 4 percent of the revised program and 8 percent from the initial program leaves substantial room for improvement, but compares favorably with FY 1976 experience when actual obligations were 9 percent below the revised program.

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Quality Assurance

(U) DARCOM continued the system assessment effort on fielded systems, assessing 59 systems in CY 1976 to identify and correct short falls in performance, training, maintenance, and logistic support. By the end of FY 1977, an additional 52 assessments were made. TRADOC and major Army user commands participated in these assessments in a forum designated Disciplined Reviews (DR). During FY 1977 DARCOM completed DR's on eight major systems.

(U) In response to ASA(I&L) direction, a DA/DARCOM Steering Group was established to review the quality of DARCOM depot reconditioning operations. This Group reviewed reconditioning operations on six weapon systems and identified and initiated corrective actions for 18 separate areas requiring management improvement.

(U) DARCOM continued its participation in the Joint Logistics Commanders initiative to improve the reliability, availability, and maintainability (RAM) of weapon systems. Efforts were underway to bring about major improvements in reliability issues related to testing and analysis, engineering data requirements and collection, acquisition management, software, and design. The program spanned FY 1976-81 and required an investment of \$7.3 million, of which \$2.5 million was to be furnished by DARCOM. This Command committed \$885.6 thousand to the effort in FY 1977.

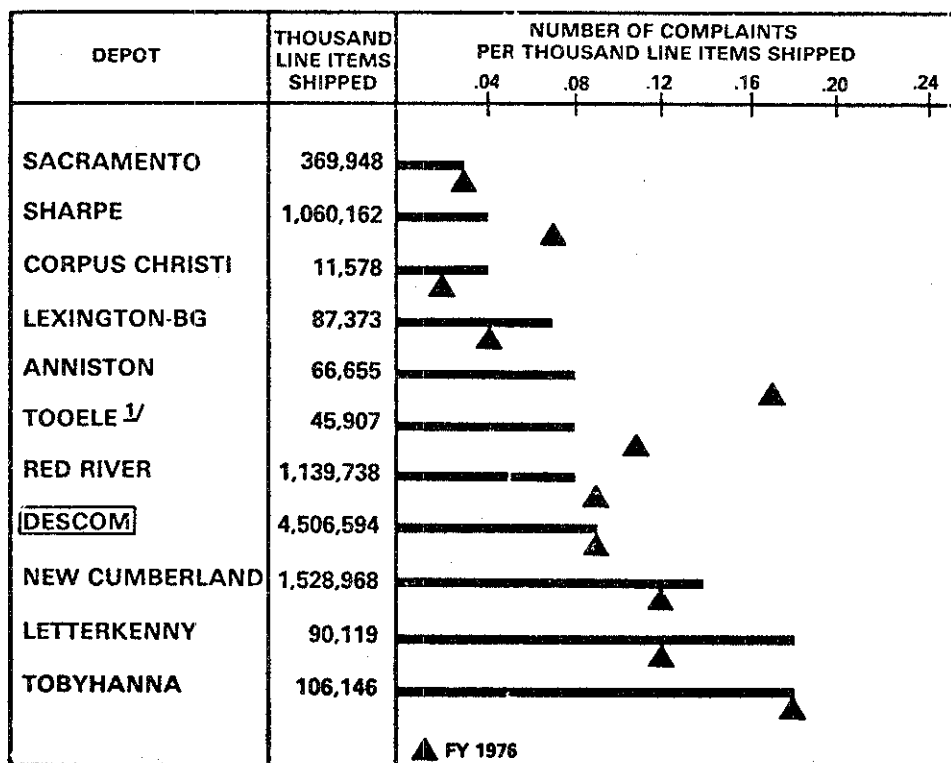
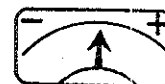
(U) Charts. Customer complaints and the depot level maintenance program are shown below.

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CUSTOMER COMPLAINTS PER THOUSAND LINE ITEMS SHIPPED

FY 1977



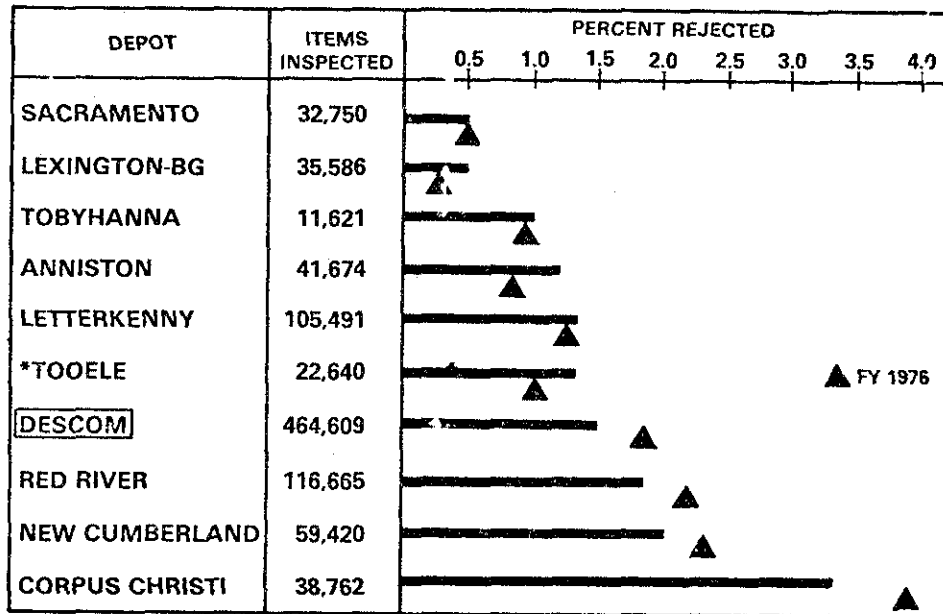
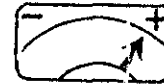
^{1/} Includes Pueblo

Customer complaints for total DESCOM for FY 1977 remained at the same level as FY 1976 while line items shipped rose by 15 percent. Customer complaints decreased at Anniston, Red River, Sharpe and Tooele. Shortages continue to be the most frequent type of complaint received. Other frequently reported complaints are: wrong materiel, overages and condition. All depots remain well under the 1 percent DARCOM target.

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DEPOT LEVEL MAINTENANCE PROGRAM FINAL INSPECTION REJECT RATES FY 1977



* Includes Pueblo

Overall final inspection reject rates decreased. Three of the nine depots' rates accounted for rate decrease in FY 1977. Slight increases were noted at five depots. Improvements in the rates, particularly those with high inspection workloads, reduced the overall DESCOM average from 1.8 percent of 1.5 percent in FY 1977 for a reduction of 20 percent.

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Other Management Efforts

(U) The realignment of Headquarters, DARCOM, into a corporate management organization was completed in October 1976. Also, the management of the depots was decentralized and strengthened by the establishment in September 1976 of the Depot System Command in Chambersburg, Pennsylvania. All legal restrictions to the Pueblo and Lexington-Blue Grass reductions and the closure of Frankford Arsenal were removed as the Army actions were upheld by the courts in each instance. The Tank-Automotive Command, Armament Command, and Missile Command were realigned in R&D and Readiness Commands, joining the Mobility Equipment R&D Command and the Natick R&D Command as completed AMARC actions.

(U) On 1 September 1976 the flag was raised at the US Army Depot System Command (DESCOM). Headquartered at Letterkenny Army Depot, Pennsylvania, it became DARCOM's 12th major subordinate command. The new command was responsible for managing the 12 depots, five depot activities, and two plants in Europe. The establishment of the command marked the implementation of a new concept of depot management -- one designed to improve the force readiness posture. Also, it reflected DARCOM's goals of decentralization of decision making responsibilities. DESCOM provided leadership and a stable atmosphere for depots to effectively support their customers. Additionally, the new command defined the role and defended the interest of depots as they related to new systems and programs. The establishment of the US Army Depot System Command symbolized a fresh approach to depot management and reflected the continuing commitment to user satisfaction and materiel and force readiness.

(U) On 7 September 1976, the Deputy Secretary of Defense approved the Army as the Single Manager (SM) for conventional ammunition. The approved plan consisted of two phases: Phase I (FY 1977-78) covered the transitioning of procurement, production, maintenance/renovation, storage and inventory/transportation management functions to the SM; provided for the SM to assume command and control of Naval ammunition Depots Hawthorne and McAlister, effective 1 October 1977; and provided for a Navy and Single Manager host-tenant agreement (with Navy as host) for that portion of Naval Weapons Support Center performing SM functions. Phase II (FY 1979-80) provided for expansion of the SM responsibilities by OSD. This expanded responsibility was to be announced later. The SM was proceeding with Phase I through Joint Services meetings, visits to Navy installations, training of other Service personnel in Army reporting requirements, and identification of positions for career development. Commander, US Army Armament Materiel Readiness Command, was assigned the responsibility to act as the SM for ammunition.

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(U) During this fiscal year, DARCOM facilities and capabilities supported training of Reserve Component units and individuals. Over 22 installations participated in mutual support programs, hosting over 200 units for annual training with an aggregate strength of over 25,000 personnel. Locally coordinated IDT (weekend) support programs were expanding rapidly. DARCOM's Logistics Management School at Fort Lee provided training to about 5,000 Reserve Component Officers in its on and off campus modes of instruction. DARCOM also administered the Army's largest mobilization designee program, with over 88 percent of the authorized 1,252 spaces filled. These personnel participated in mission oriented on-the-job training assignments during their two weeks of active duty each year and were to become DARCOM assets upon mobilization.

(U) DARCOM continued to make programs in enhancing the environmental posture of the command's facilities. By the end of FY 1976, the command was involved in a total of 212 air and water pollution control projects costing nearly \$300 million. During FY 1976 there were 19 projects authorized and funded for \$26.6 million. Seven were submitted to Congress for \$55.6 million for FY 1977. In the area of pollution control of vehicles and watercraft, DARCOM continued to make progress through developmental work and product improvements. These actions led to certification or served as evidence of good faith efforts which were necessary to support a request for exemption from emission standards.

(U) With the continued national emphasis of protection of the environment, DARCOM carried out an extensive program to examine its installations that had a history of involvement with hazardous chemical, radiological or biological materials. This was to ensure that the surrounding communities were not endangered by contaminate migration resulting from test operations in the storage, testing or disposal of these materials. In the first quarter of FY 1977, the Army was charged with the DOD responsibility to develop the environmental standards, analytical methods and containment/detoxification techniques for use by the Services in this program.

(U) In January 1977 DARCOM made a significant advancement in the automated systems program when the Tank-Automotive Readiness Command (TARCOM) took the final steps to convert to ALPHA, the base-line of the Commodity Command Standard System (CCSS). With this action all DARCOM NICP's and NMP's became fully operational under ALPHA which was the largest automated system ever fielded successfully by government or industry. All DARCOM depots had been fully operational under SPEDEX, the standard depot system. Finally, with both ALPHA and SPEDEX fully operational, the Army became the fore-runner of all the Services in automated support of wholesale logistic functions.

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GLOSSARY

| | |
|-----------|--|
| AAA | Army Audit Agency |
| AAO | Authorized Acquisition Objective |
| ACAMS | Automatic Continuous Air Monitoring System |
| ACODS | Army Container Oriented Distribution System |
| ADEN/DEFA | Armament Development in Field/Direction d'Etude et Fabrication d'Armement |
| ADP | Automatic Data Processing |
| AFLC | Air Force Logistics Command |
| AFSC | Air Force Systems Command |
| AIF | Army Industrial Fund |
| AITF | Ammunition Initiative Task Force |
| ALMC | Army Logistics Management Center |
| ALMSA | Automated Logistics Management Systems Agency |
| ALO | Authorized Level of Organization |
| ALOC | Air Line of Communications |
| AMARC | Army Materiel Acquisition Review Committee |
| AMETA | Army Management Engineering Training Agency |
| AMME | Automated Multi-Media Exchange |
| AMMRC | Army Materials and Mechanics Research Center |
| AMSAA | Army Material Systems Analysis Activity |
| AMSF | Area Maintenance Supply Facility |
| ANMCC | Alternate National Military Command Center |
| APA | Army Procurement Appropriation |
| APC | Armored Personnel Carriers |
| APM | Army Program Manager |
| ARMCOM | US Army Armament Command |
| ARNGUS | Army National Guard of the United States |
| ARRADCOM | US Army Armament Research and Development Command |
| ARRCOM | US Army Armament Materiel Readiness Command |
| ASA(I&L) | Assistant Secretary of the Army (Installations and Logistics) |
| ASA(R&D) | Assistant Secretary of the Army (Research and Development) |
| ASARC | Army Systems Acquisition Review Committee |
| ASC | Autodin Switching Center |
| ASL | Authorized Stockage List |
| ASP | Ammunition Supply Point |
| ATE | Automatic Test Equipment |
| ATIS | Automatic Terminal Information Center |
| ATSS | Automatic Test Support System |
| AVRADCOM | US Army Aviation Research and Development Command |
| AVSCOM | US Army Aviation Systems Command |
| BFA | Blank Fire Attachment |
| BITE | Built-in Test Equipment |
| BOD | Beneficial Occupancy Date |

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| | |
|----------|---|
| BOM | Bills of Material |
| BPS | Bits per second |
| BRL | Ballistics Research Laboratory |
| BSI | Battlefield Systems Integration |
| BUEX | Bureau of Explosives |
| | |
| CADS | Containerized Ammunition Distribution System |
| CAMDS | Chemical Agent Munitions Disposal System |
| CAS | Cost Accounting Standards |
| CBR | Chemical, Biological, Radiological |
| CCAD | Corpus Christi Army Depot |
| CCB | Configuration Control Board |
| CCSS | Commodity Command Standard System |
| CE | Corps of Engineers |
| CEMO | Communications-Electronics Mission Orders |
| CEQ | Council for Environmental Quality |
| GERCOM | Communications and Electronics Materiel Readiness Command |
| CFV | Cavalry Fighting Vehicle |
| CINCPAC | Commander-in-Chief, Pacific |
| CIVPERS | Civilian Personnel |
| CLI | Communications Line Inter-face |
| CM | Confirugation Management |
| COA | Comptroller of the Army |
| COBE | Command Operating Budget Estimate |
| COEA | Cost & Operational Effectiveness Analysis |
| COMMZ | Communications Zone |
| CONUS | Continental US |
| CORADCOM | US Army Communications Research & Development Command |
| COREP | Contracting Officers Representative |
| COSSA | Containerized Shipment and Storage of Ammunition |
| CSC | Civil Service Commission |
| CSC | Combat Support Center |
| CSL | Chemical Systems Lab |
| CSLA | Communications Security Logistics Activity |
| CVKI-PD | Combat Vehicle Kill Indicator-Pyrotechnic Device |
| CVSD | Continuously varying slope delta |
| CWE | Construction work estimate |
| | |
| DARCOM | USA Materiel Development & Readiness Command |
| DATEP | DA Telecommunications Plan |
| DATS | Drill and Transfer System |
| DC | Direct Current |
| DCAA | Defense Contract Audit Agency |
| DCA-PAC | Defense Communications Agency-Pacific Area |
| DCASR | Defense Contract Administration Services Region |
| DGMD | Deputy Commanding General for Materiel Development |
| DGMR | Deputy Commanding General for Materiel Readiness |
| DCL | Direct Communications Link |
| DCSLOG | Deputy Chief of Staff for Logistics |
| DCSOPS | Deputy Chief of Staff for Operations |

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|---------|---|
| DCSPER | Deputy Chief of Staff, Personnel |
| DCSRDA | Deputy Chief of Staff for Research, Development & Acquisition |
| DDR&E | Defense Director for Research & Engineering |
| DEB | Digital European Backbone |
| DESCOM | US Army Depot Systems Command |
| DEVA | Development Acceptance |
| DFSR | Detailed Functional Systems Requirements |
| DIVRAS | Division Real Time Application Specification |
| DLA | Defense Logistics Agency |
| DLS | Direct Logistics Support |
| DMI | Depot Maintenance Interservice |
| DPE | Demilitarization protective ensemble |
| DRAMA | Digital Radio & Multiplexer Acquisition |
| DRCBSI | Directorate for Battlefield Systems Integration |
| DRCDE | Directorate for Development and Engineering |
| DRCPA | Directorate for Plans & Analysis |
| DRCPI | Directorate for Product Improvement |
| DRCQA | Directorate for Quality Assurance |
| DRCRE | Directorate for Materiel Readiness |
| DRES | DARCOM Readiness Evaluation System |
| DSA | Defense Supply Agency |
| DSAA | Defense Security Assistance Agency |
| DSARC | Defense Systems Acquisition Review Council |
| CS/GS | Direct Support/General Support |
| DSTE | Digital Subscriber Terminal Equipment |
| DT | Development Test |
| DTC | Design-to-cost |
| DT/OT | Development Testing/Operational Testing |
| DTS | Demonstration Test Specification |
| DU | Depleted uranium |
| | |
| ECOM | US Army Electronics Command |
| ECP | Engineering Change Proposals |
| EDMS | Engineering Data Micro-Reproduction Systems |
| EIR | Equipment Improvement Recommendations |
| EMI | Electromagnetic Interface |
| EOH | Equipment on hand |
| EPA | Economic Price Adjustment |
| ERADCOM | US Army Electronics Research and Development Command |
| ESC | Energy Steering Committee |
| ET | Earth terminal |
| ETS | European Telephone System |
| EW | Electronic Warfare |

| | |
|---------|--|
| FAAR | Forward Area Alerting Radar |
| FAO | Finance & Accounting Office |
| FAS | Force Accounting System |
| FIO | Foreign Intelligence Office |
| FKV | Frankfurt-Koenigstuhl-Vaihingen |
| FMC | Food Machinery Corporation |
| FMS | Foreign Military Sales |
| FORSCOM | US Army Forces Command |
| FRG | Federal Republic of Germany |
| FSCS | Foresight Sierra Communications System |
| FSED | Full Scale Engineering Development |
| FVS | Fighting Vehicle Systems |
| | |
| GAO | General Accounting Office |
| GFE | Government Furnished Equipment |
| GOCO | Government-Owned Contractor-Operated |
| GOPIRB | General Officer Product Improvement Review Board |
| GS | General Support |
| GSA | General Services Administration |
| GSRS | General Support Rocket System |
| | |
| HAZCOM | Hazardous conditions |
| HCCC | Hot cup cold coin |
| HCN | Hydrogen Cyanide |
| HDL | Harry Diamond Labs |
| HE | High explosive |
| HEL | Human Engineering Lab |
| HPA | High power amplifier |
| | |
| IBEA | Industrial Base Engineering Activity |
| ICF | Interconnect facility |
| IDCSS | Interim Digital Communications Subsystem |
| IEP | Integrated Engineering Plan |
| IFV | Infantry Fighting Vehicle |
| IIP | Implementation & Installation Plan |
| ILCOM | International Logistics Command |
| ILO | Interservice Liaison Officers |
| ILS | Integrated Logistic Support |
| INDOCOM | Indonesian Communications System |
| INSCOM | Intelligence Security Command |
| IOC | Initial Operational Capability |
| IPF | Initial Production Facility |
| IPG | Issue Priority Groups |
| IR | Installation Restoration |
| IR&D | Independent Research & Development |
| IRSKIT | Internal Restraint Kit |
| I& SA | Installations & Service Agency |
| ITV | Improved TOW Vehicle |

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|-----------|--|
| JBOD | Joint Beneficial Occupancy Date |
| JCAP | Joint Conventional Ammunition Program |
| JLOTS | Joint Logistics-Over-the-Shore |
| JOP | Joint Operating Procedures |
| JOR | Joint Operational Requirements |
| | |
| KE | Kenetic energy |
| KKK | Kodam, Koreim, Kodim |
| | |
| LADAME | Lethal Agent Detection & Monitoring Equipment |
| LADPOP | Lethal Agent Demilitarization Process Optimization Program |
| LAP | Load, Assemble & Pack |
| LCC | Life Cycle Costing |
| LIF | Logistics Intelligence File |
| LOA | Letter of Agreement |
| LOGCAP | Logistics Assessment Program |
| LOS | Line-of-sight |
| LRIP | Low Rate Initial Production |
| LSAR | Logistics Support Analysis Record |
| LSSA | Logistics Systems Support Agency |
| | |
| MACOM | Major Army Commands |
| MAP | Military Assistance Program |
| MCA | Military Construction, Army |
| MERADCOM | Mobility Equipment Research & Development Command |
| MICVS | Mechanized Infantry Combat Vehicle System |
| MILPERCEN | Military Personnel |
| MILSTEP | Military Supply and Transportation Evaluation Procedures |
| MIP | MILSTEP Improvement Program |
| MIRADCOM | US Army Missile Research and Development Command |
| MIRCOM | US Army Missile Materiel Readiness Command |
| MISG | Maintenance Interservice Support Group |
| MISMO | Maintenance Interservice Support Management Office |
| MMC | European Maintenance Management Center |
| MMT | Miniature Moving Targets |
| MMT | Manufacturing Methods & Techniques |
| MODLOG | Modernization of Logistics |
| MOLINK | Moscow & Washington Communications Link |
| MOS | Military Occupational Specialty |
| MOU | Memorandum of Understanding |
| MPBME | Munitions Production Base Modernization & Expansion |
| MRC | Materiel Release Confirmation |
| MSC | Major Subordinate Command |
| MTAG | Manufacturing Technology Advisory Group |
| MTBF | Mean Time Between Failures |
| MTG/WESS | Main Tank Gun/Weapons Effects Signature Simulator |
| MTMC | Military Traffic Management Command |
| MTOE | Modification Table of Organization and Equipment |

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| | |
|----------|---|
| NARADCOM | US Army Natick Research and Development Command |
| NATO | North Atlantic Treaty Organization |
| NCAD | New Cumberland Army Depot |
| NET | New Equipment Training |
| NICP | National Inventory Control Point |
| NMC | Naval Materiel Command |
| NORS | Not Operationally Ready, Supply |
| OMA | Operation & Maintenance, Army |
| OMB | Office of Management & Budget |
| OMT | Office of Manufacturing Technology |
| OPA | Other Procurement Army |
| OSD | Office, Secretary of Defense |
| OSHA | Occupational Safety and Health Act |
| OT | Operational Test |
| OTC | Over-the-counter |
| OTEA | Operational Test & Evaluation Agency |
| PA | Procurement Appropriation |
| PA | Procurement of Ammunition, Army |
| PACAF | Pacific Air Forces |
| PACFLT | US Pacific Fleet |
| PBS | Production Base Support |
| PEP | Plant Equipment Packages |
| PERT | Program Evaluation Review Technique |
| PID | Pre-installation demonstration |
| PIF | Provision of Industrial Facilities |
| PIP | Performance-Improvement Program |
| PM | Project Manager |
| PMR | Procurement Management Review |
| POMCUS | Prepositioned Materiel Configured to Unit Sets |
| PPM | Parts per million |
| PPM | Parts per minute |
| PQT-C | Prototype Qualification Test - Contractor |
| PQT-G | Prototype Qualification Test - Government |
| QRP | Quick reaction project |
| RAM | Reliability, Availability, Maintainability |
| RDTE | Research, Development, Test & Evaluation |
| REDCOM | Readiness Condition |
| REFLEX | Reconciliation of Workload, Funds, and Manpower |
| ROC | Required Operational Capability |
| ROC | Republic of China |
| ROID | Report of Item Discrepancy |
| RIF | Reduction in Force |

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| SAAC | Security Assistance Accounting Center |
| SDMIS | Standard Depot Management Information System |
| SFTS | Synthetic Flight Training System |
| SIDPERS | Standard Installation/Division Personnel System |
| SIGINT | Signal Intelligence |
| SLUFAE | Surface Launched Unit Fuel Air Explosive |
| SM | Single Management |
| SM&S | Supply, Maintenance & Services |
| SOW | Statement of Work |
| SOW | Scope of Work |
| SRA | Special Repair Activities |
| SSC | Software Support Center |
| SSEB | Source Selection Evaluation Board |
| SUBMACOM | Subordinate Major Command |
| | |
| TACOM | Tank-Automotive Command |
| TAMMS | The Army Maintenance Management System |
| TARADCOM | US Army Tank-Automotive Research & Development Command |
| TARCOM | US Army Tank-Automotive Materiel Readiness Command |
| TBAT | TOW Bushmaster Armored Turret |
| TC | Ton Containers |
| TCF | Technical Control Facility |
| TCIP | Technical Control Improvement Program |
| TCN | Territorial Command Network |
| TDA | Table of Distribution and Allowance |
| TD/CMS | Tables of Distribution/Configuration Management System |
| TDP | Technical Development Plan |
| TDY | Temporary Duty |
| TECOM | US Army Test & Evaluation Command |
| TIWG | Test Integration Working Group |
| TLV | Threshold Limit Value |
| TMDE | Test, Measurement and Diagnostic Equipment |
| TOW | Tube Launched, Optically Tracked, Wire Guided |
| TRADER | Training Device Requirement Office |
| TRADOC | US Army Training and Doctrine Command |
| TROSCOM | US Army Troop Support Command |
| TSARCOM | US Army Troop Support & Aviation Materiel Readiness Command |
| TSD | Technical Support Division |
| TVOR | Terminal VHF Omni-Range |
| | |
| UCARS | Uniform Cost Accounting & Reporting System |
| UPS | Uninterrupted Power Sources |
| USAILCOM | US Army International Logistics Command |
| USAIMA | United States Army Institute for Military Assistance |
| USAMMC | USA Maintenance Management Center |
| USAREUR | US Army, Europe |
| USASA | US Army Security Agency |
| USMTM | US Military Training Mission |

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| VCSA | Vice Chief of Staff, Army |
| VE | Value Engineering |
| VRFS | Vehicle Rapid Fire Weapon System |
| VTAADS | Vertical the Army Authorization Documents System |
| WBSVVS | Wideband Secure Voice Via Satellite |
| WWMCCS | Worldwide Military Command and Control System |

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HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 EISENHOWER AVE, ALEXANDRIA, VA 22333
STAFF DIRECTORY



| OFC OF DEPUTY CG FOR MATERIEL READINESS DRCDMR | | | |
|--|--------------------|-------------|-----------|
| Asst Deputy for Mat Readiness | MR J F MACLIN | 10506 49701 | DRCDMR |
| Executive Officer | COL D W STALLINGS | 10506 49702 | DRCDMR |
| Coordinator | LTC D G FITZGERALD | 10510 48896 | DRCDMR TG |
| Coordinator | LTC R M REYNOLDS | 10510 48896 | DRCDMR TG |
| Task Group | LTC J P DRESKA | 10510 48895 | DRCDMR TG |
| SA/US ARNG | COL R W BOOTH | 10514 48895 | DRCSA NG |
| SA/USA Reserve | LTC G H CHASE | 10514 48895 | DRCSA AR |
| SA/Nuclear Surety | MR R L MILLER | 10518 49554 | DRCSA NS |
| SA/Chemical Surety | MAJ J FLOYD | 10518 49610 | DRCSA CS |

| DIRECTOR FOR INTERNATIONAL LOGISTICS DRCL | | | |
|---|----------------|------------|------|
| Director | MG J E FIX III | 5E22 48380 | DRCL |
| Deputy Director | MR R E BEAN | 5E22 48383 | DRCL |

| US ARMY INTERNATIONAL LOGISTICS COMMAND DRSL | | | |
|--|----------------|------------|---------|
| (Washington Field Office (WFO)) | | | |
| Commander | MG J E FIX III | 5E22 48380 | DRSL |
| Chief WFO | MR R E BEAN | 5E22 48383 | DRSL W |
| Chief of Staff | COL R L WELDE | 5E22 48384 | DRSL S |
| Mgt Spt Ofc | E J COLEMAN | 5E18 48385 | DRSL WO |

| | | | |
|--|------------------|------------|---------|
| Directorate for Plans Systems & Analysis | F F BROTT | 5N16 49895 | DRSL WS |
| Directorate for Prog Mgt | COL S E HOLTOM | 7550 48247 | DRSL WP |
| Quality Assurance Ofc | G Y OKA | 4W08 48889 | DRSL WQ |
| Directorate for Mid East/Africa | COL D M BELL | 5544 48405 | DRSL WM |
| Directorate for Europe | COL G D JONES | 5554 48399 | DRSL WE |
| Directorate for Americas/Pacific | COL C D FOUNTAIN | 5522 48451 | DRSL WA |

| DIRECTORATE FOR MATERIEL MGT DRCLM | | | |
|--|----------------------|------------|----------|
| Director | MG F C SHEFFEY | 6E06 48539 | DRCLM |
| Deputy Director | MR M I HINSON | 6E06 48097 | DRCLM |
| Executive Off | LTC A T CONROY | 6E06 48098 | DRCLM |
| Admin Off & DCGMR WPC | MR W L STEPHENS | 6N49 48590 | DRCLM A |
| Assoc Dir for Requirements & Resources | COL J R GRAVES (Act) | 6W06 48732 | DRCLM R |
| Asst for Secondary Items | COL R N BOWMAN | 6N14 48634 | DRCLM RS |
| Assoc Dir for Supply & Distribution | COL O C GRUMMT | 6S06 48701 | DRCLM S |
| Assoc Dir for Evaluation | MR G C COX | 6N44 48559 | DRCLM E |
| Assoc Dir for Maintenance | COL R D DESCOTEAU | 6N24 48619 | DRCLM M |
| MODLOG 77 Project Ofc | LTC W F DILLON | 6C43 49814 | DRCLM L |

| DIRECTORATE FOR READINESS DRCRE | | | |
|---|-----------------------|------------|---------|
| Director | MG H B GIBSON JR | 5N58 49718 | DRCRE |
| Deputy Director | MR H J BUKOWSKI | 5N58 49719 | DRCRE |
| Executive Officer | COL P D HAUN | 5N58 49720 | DRCRE |
| Proj Off for TMDE (Vacancy) | 5E11 49731 | DRCRE T | |
| Admin Officer (Vacancy) | 5E07 49738 | DRCRE A | |
| Associate Director for Integrated Logistics Support | COL J J O'QUINN (Act) | 5N42 49759 | DRCRE I |
| Associate Director for Force Status & Customer Assistance | COL J J WILLIAMS | 5N26 49890 | DRCRE F |
| Associate Director for Equip Improvement | MR D J HAMERNIK | 5N39 49769 | DRCRE E |

| DIRECTORATE FOR PROCUREMENT & PRODUCTION DRCP | | | |
|---|----------------------|------------|--------|
| Director | MG H F HARDIN JR | 9E06 48159 | DRCP |
| Deputy Director | MR G E DAUSMAN | 9E06 48167 | DRCP |
| Executive Officer | LTC E L DZANIS | 9E06 48169 | DRCP |
| Plans & Admin Office | MR R POSPICHIL | 9E19 48170 | DRCP A |
| Assoc Dir for Cost Performance Reporting | COL W F WILLIAMS | 9532 48319 | DRCP K |
| Assoc Dir for Industrial Base | COL C W McDOWELL JR | 9E22 48189 | DRCP I |
| Assoc Dir for Procurement | MR W L CLEMONS (Act) | 9N56 48262 | DRCP S |
| Assoc Dir for Procurement Mgt Review | MR V O EWELL | 9546 48178 | DRCP R |
| Assoc Dir for Programs | COL C R J ROGERS | 9548 48339 | DRCP P |
| Special Asst for Small Business | MR J RAMIREZ | 9N13 48185 | DRCP Z |

| DIRECTORATE FOR PLANS, DOCTRINE & SYS DRCP | | | |
|--|-------------------|---------------|--------|
| Director | BG M O REDIC JR | 6S06 48761 | DRCP |
| Deputy Director | MR L Wm HOCHMEIER | 6S06 48787 | DRCP |
| Executive Officer | LTC H E DAHL | 6S06 48769 | DRCP |
| Assoc Director for Plans & Doctrine | COL H D LARSON | 6516 48654 | DRCP S |
| Assoc Director for Systems | COL N W FLEMING | 6W20 48755 | DRCP S |
| Chief DOD Materiel Distribution Systems Office | COL C V SORRELS | 3N47 325 0399 | DRCP D |

| TO HEADQUARTERS, DARCOM | | | |
|--|--------------------|------------------|---------|
| *United Kingdom | LTC G M HUTCHINSON | REME 10544 49675 | BLNO |
| *Canada | LTC R W IRVINE | 10544 49679 | CLNO |
| *Germany | COL H R ROTHE | 10538 49684 | FRGLNO |
| Marine Corps | MAJ T W ROBERTS | 10544 49676 | DRGCS F |
| TRADOC/Logistics Center | LTC H M HAMMER | 10C09 49467 | DRGCS L |
| *DARCOM POINT OF CONTACT FOR ALL DOCUMENTS AND VISITS IS SECURITY OFFICE ROOM 4N24 TEL EXT 48676/48677 | | | |

AUGUST 1976
THIS IS NOT AN OFFICIAL ORGANIZATIONAL CHART

| COMMANDER'S PERSONAL STAFF DRCCG | | | |
|----------------------------------|---------------|-------------|-------|
| Executive Officer | LTC E E BEACH | 10E08 49625 | DRCCG |
| Secretary | MRS W KNOTT | 10E08 49626 | DRCCG |

| DIRECTORATE FOR PERS, TNG & FORCE DEV DRCP | | | |
|--|------------------------|------------|----------|
| Director | BG L S WRIGHT | 2E14 48195 | DRCP |
| Deputy Director | MR W S CHARIN | 2E14 48195 | DRCP |
| Executive Off | LTC J E MOORE | 2E14 48195 | DRCP |
| Plans & Admin Ofc | MR C W ROHRER | 2E18 48421 | DRCP A |
| Civ Pers Div | MR G N KELLET | 2W20 49167 | DRCP C |
| Force Dev Div | MR J B MONG | 2E08 48215 | DRCP S |
| Mil Pers Div | COL B R ADAMS JR | 2556 49325 | DRCP M |
| Race Relations/EO Ofc | CPT A GREENFIELD (Act) | 2N06 49415 | DRCP R |
| Alcohol & Drug Abuse Ofc | MR D HELBIG | 2N07 49344 | DRCP H |
| STAFF SUPPORT ACTIVITIES | | | |
| HQ Civ Pers Ofc | MR R VELTHUIS (Act) | 2532 49427 | DRXMM CO |
| HQ Mpr Ofc | MR P R ZEKAN | 2N46 48974 | DRXMM SM |
| HQ Mil Pers Ofc | MAJ E L KENNEDY | 2C45 49333 | DRXMM MR |
| HQ Race Relations/EO Ofc | LT J E TUCKER | 1N07 49477 | DRXMM RR |
| HQ Alcohol & DA Ofc | MR D HELBIG | 2N07 49344 | DRXMM AD |

| DIRECTORATE FOR QUALITY ASSURANCE DRCPA | | | |
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| Executive Asst | MR S R DAVEAU | 4W22 48930 | DRCPA |
| Plans & Concepts Ofc | MR W KRACOV | 4527 48029 | DRCPA C |
| Product Quality Div | MR R F TINER | 4W20 48899 | DRCPA P |
| Reliability & Sys Assessment Div | MR A H NORDSTROM JR | 4506 48912 | DRCPA E |

| DIRECTORATE FOR PLANS & ANALYSIS DRCPA | | | |
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| Deputy Director | MR D J SHEARIN | 10N36 49472 | DRCPA |
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| Mil Plans & Ops Div | COL L G PANNIER JR | 7N22 48550 | DRCPA M |
| Mission & Org Div | MR R G SILVEY | 10529 49439 | DRCPA O |
| Program Plans & Policies Div | MR W C KREMAN | 10511 49448 | DRCPA P |
| Sys Anal Div | COL J A DONNAN | 10N30 49459 | DRCPA S |

| DIRECTORATE FOR INSTALLATIONS & SERVICES DRCS | | | |
|---|-------------------|------------|--------|
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| Deputy Director | MR J W BOUCHER | 5W12 49041 | DRCS |
| Engineer Div | COL W P SCHILLING | 5N06 49390 | DRCS E |
| Housing Mgt Div | MR W H McDONALD | 5N10 49012 | DRCS H |
| Services Div (Vacancy) | 5506 49389 | DRCS S | |
| Plans & Programs Ofc | MR J D HARTSOE | 5W20 49026 | DRCS P |

| EQUAL EMPLOYMENT OPPORTUNITY OFFICE DRCEE | | | |
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| DARCOM Equal Employment Opportunity Off | MR G L JONES | 7N38 49690 | DRCEE |
| DARCOM Fed Women's Prog Coordinator | MS R GNADT | 7N38 49690 | DRCEE |
| DARCOM Spanish Speaking Prog Coordinator | MR F ROSARIO | 7N38 49690 | DRCEE |

| HQ EQUAL EMPLOYMENT OPPOR OFC DRCEE | | | |
|---|------------------|------------|---------|
| HQ Equal Employment Opportunity Officer | MR M W FRANCIOSI | 5518 49836 | DRCEE H |
| HQ Federal Women's Program Coordinator | MRS E D MANGANA | 5518 49836 | DRCEE H |

| LIAISON FROM HEADQUARTERS, DARCOM TO | | | |
|--|-----------------|------------------------|--------------|
| Hq AF Systems Command* | MR J H PROCTOR | 981 5181 | DRXFA(SDOA) |
| US Navy Weapons Center* | LTC R F BOYD | 898 1700 X3544 & X3545 | CODE 144 |
| Kirtland AFB* | COL J A BERRIER | 964 4822 | DRFO |
| DARCOM FIELD SUPPORT ACTIVITY/TCATA FT HOOD TX | COL J R JARVIS | 737 6608 | DRXFS |
| Wright Patterson AFB* | MAJ J A EVANS | 785 5145 | ASD/YPT Army |
| *FOR MAILING ADDRESS MISSION INFO ETC CALL OR VISIT DRCEE X TEL EXT 49494 ROOM 8E08 5001 EISENHOWER AVE ALEXANDRIA, VA 22333 | | | |

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CABLE ADDRESS CDRDRC ALEX VA
STAFF DUTY OFFICER
AUTOVON 284-9223
COMMERCIAL 202-274-9223
OPERATIONS CENTER 274-8660

| | | | |
|------------------------------------|--------------------|-------------|--------|
| COMMANDING GENERAL | GEN J R DEANE, JR | 10E08 49625 | DRCCG |
| Deputy CG for Materiel Development | LTG G SAMMET, JR | 10N06 49705 | DRCDMD |
| Deputy CG for Materiel Readiness | LTG E J D'AMBROSIO | 10S06 49700 | DRCDMR |
| Chief of Staff | MG R L KIRWAN | 10E14 49641 | DRCCS |
| Deputy Chief of Staff | COL R D CROSBY, JR | 10E14 49638 | DRCCDS |
| Command Sergeant Major | CSM H W SHEDD | 10S48 48257 | DRCCSM |

| OFFICE OF THE COMPTROLLER DRCCP | | | |
|--|----------------------|------------|---------|
| Comptroller | MR R H RUHLAND (Act) | 3N58 49131 | DRCCP |
| Deputy Compt | BG A J CADE (Act) | 3N58 49129 | DRCCP |
| Executive Off | LTC J W PRICE | 3N58 49130 | DRCCP |
| Administrative Ofc | MR L S BROWN | 3N57 49124 | DRCCP A |
| Cost Anal Div | MR R R MCGREGOR | 3534 49100 | DRCCP E |
| Fin & Acct Div (Vacancy) | 3W06 49171 | DRCCP F | |
| Internal Review & Audit Compliance Ofc | MR J K CHURCH | 3550 49111 | DRCCP I |
| Mgt Div | COL P W MCGURL | 3E10 49029 | DRCCP M |
| Resources & Programs Division | COL J W LOWDEN JR | 3N54 49235 | DRCCP B |
| Review & Anal Div | MR I BERG | 3510 49055 | DRCCP R |

| OFFICE OF THE INSPECTOR GENERAL DRDIG | | | |
|---------------------------------------|-------------------------------------|------------|---------|
| Inspector General | COL M R WAGNER | 1512 48070 | DRDIG |
| DARCOM Inspector General Activity | | | |
| Eastern Inspection Division (Vacancy) | 1524 48084 | DRDIG E | |
| Coordination & Control Division | MR R V MURPHY | 1514 48072 | DRDIG X |
| Investigations Division | COL S P DOTUR | 1508 48064 | DRDIG V |
| Western Inspection Division | COL C B HADEN Autovan 693 3441/3442 | DRDIG W | |
| Administrative Officer | MRS G W LEAK | 1514 48079 | DRDIG X |

| HISTORICAL OFFICE DRCHO | | | |
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| Annual Historical Reports/Unit Histories | MR M G MARKEN, SR | 3526 49553 | DRCHO |
| Historical Monographs/Studies | MR C W LYLICH | 3526 49553 | DRCHO |
| Special Studies/Historical Services | MR A A PUTIGNANO (Act) | 3526 49553 | DRCHO |
| Historical Sources | MR M F COPPOLA | 3526 49021 | DRCHO |

| DIRECTOR OF COMM ELECTRONICS & US ARMY COMM COMMAND-DARCOM DRCEE | | | |
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| Director | COL M M MOORE JR | 5510 49394 | DRCEE |
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| Deputy Commander | COL J D MITCHELL | 4N16 48173 | CCNC C |
| SGT Major | SM J CECCOLI | 4N16 49667 | CCNC SM |
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| Plans Div | J E GOTTFRIED | 5510 49398 | DRCEE P |
| Resources Div | A E PAIGE | 4N17 48191 | DRCEE R |

| USA DARCOM SERVICE SUPPORT ACTIVITY DRXAM | | | |
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| Deputy Director | MR J R GROUNDWATER | 1E14 48134 | DRXAM |
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| Audio Visual Presentations Div | MR B W ADKINS | 1C09 48480 | DRXAM P |
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| HQ Budget & Prog Ofc | MR H B HARE | 1E18 48129 | DRXAM B |
| HQ Security Ofc | MRS B E MILLER | 1E22 49066 | DRXAM S |
| Staff C E Officer | MAJ E R THOMAS | G3C20 48989 | DRXAM CE |
| Staff Librarian | MS I O THOMAS | 7535 48087 | DRXAM L |
| HQ Tech Library | MS S J WEBBER | 7535 48152 | DRXAM TL |

| MISCELLANEOUS NUMBERS | | | |
|---------------------------------------|------------------|-------------|--|
| STAFF DUTY OFFICER | G2C60 49223 | | |
| AMBULANCE | 1531 48296 | | |
| (During Duty Hours Call the Clinic) | Lobby 9 557 1144 | | |
| DARCOM OPERATIONS CENTER | G2C60 48660 | | |
| LSSA MANAGEMENT INFORMATION CTR | G3C46 49122 | DRXLS LH | |
| DARCOM PERS SPT AGCY | 2E18 48499 | DRXMM P | |
| BUILDING ADMINISTRATOR | 1534 48099 | OBM DARCOM | |
| CIVILIAN EMPLOYEE HEALTH SVC (Clinic) | 1531 48296 | | |
| CLASSIFIED MAIL CENTER | G2W07 49585 | DRXAM AMC | |
| COMMAND CONFERENCE ROOM | 10N48 48988 | DRXAM PA | |
| CONFERENCE ROOM SCHEDULING | 1517 48485 | DRXAM PA | |
| DRIVERS SERVICE | G2W12 48091 | DRXAM GP | |
| GRAPHICS FACILITY | 1C22 48491 | DRXAM PG | |
| GUARD OFFICE | Lobby 9 557 1144 | | |
| HQ USAC DARCOM | 4N16 48173 | CCNC DC | |
| LOCATOR SERVICE (MIL PERS) | 2C45 49339 | DRXMM MR | |
| LOCATOR SERVICE (CIV PERS) | 2C33 49491 | DRXMM CO | |
| PHOTOGRAPHIC FACILITY | 1C44 48489 | DRXAM PP | |
| RECEPTIONIST | Lobby 49191 | DRXAM G | |
| SPECIAL SECURITY OFFICE (SSO) | G2C63 48986 | DAMI SG DRC | |
| TELECOMMUNICATIONS CENTER | G3C24 49009 | CCNC CSA T | |
| TOP SECRET REPOSITORY | G2W09 49590 | DRXAM AMT | |
| TRAVEL BRANCH | 1546 48110 | DRXAM GT | |
| UNCLASSIFIED MAIL CENTER | G2C16 49594 | DRXAM AMU | |
| USA EQUIP AUTHORIZATIONS REV ACTV | 9N31 49292 | DRXEA C | |
| WASH PROCUREMENT OFFICE ECOM | 4W06 48878 | DRSEL PP CW | |
| DARCOM REPORTS MANAGEMENT OFFICE | 4N45 49051 | DRXLS LB | |

| SECRETARY OF THE GENERAL STAFF DRCCS | | | |
|--------------------------------------|-------------------|-------------|---------|
| Secy General Staff | COL R D CROSBY JR | 10E14 49638 | DRCCS |
| Dep Secy General Staff | LTC R C WHEELER | 10560 49644 | DRCCS |
| Asst Secy General Staff | LTC R T BOYLE | 10560 49645 | DRCCS |
| Asst Secy General Staff | MAJ B E SMITH | 10554 49645 | DRCCS |
| Asst Secy General Staff | MAJ W W WINSLOW | 10554 49645 | DRCCS |
| Asst Secy General Staff | CPT W S LACY | 10554 49646 | DRCCS |
| Asst Secy General Staff | CPT J K MILLER | 10560 49646 | DRCCS |
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| Command Counsel | MR F X MCKENNA | 7E06 48046 | DRCCG |
| The Deputy Command Counsel | | | |
| Deputy Command Counsel/Command Staff Judge Advocate | MR B M BLAIR | 7E06 48046 | DRCCG P |
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| Mil Law/Legal Svc Div | MR R S HAWLEY | 7N48 48052 | DRCCG S |
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| Plans & Operations Ofc | MR J K GAISER | 7E06 48046 | DRCCG A |

| DIRECTORATE FOR MGT INFO SYSTEMS DRCMS | | | |
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| Executive Off | COL A L SHEDDER JR | 4E16 48627 | DRCMS |
| Rch Div | MR J CLANFONE | 4E08 48946 | DRCMS I |
| Mat Acq Sys Div | DR R P UHLIG | 4N52 49140 | DRCMS E |
| Mat Rdn Sys Div (Vacancy) | | | |

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HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND

5001 EISENHOWER AVE., ALEXANDRIA, VA 22333

STAFF DIRECTORY



| OFC OF DEPUTY CG FOR MATERIEL READINESS DRCDMR | | | | |
|--|----------------------|-------------|-----------|--|
| Asst Deputy for Mat Readiness | MR. J. F. MACLIN | 10506 49701 | DRCDMR | |
| Executive Officer | COL D. W. STALLINGS | 10506 49702 | DRCDMR | |
| Coordinator | LTC D. G. FITZGERALD | 10510 48896 | DRCDMR-TG | |
| PM Coordinator | LTC R. M. REYNOLDS | 10518 49406 | DRCDMR-TG | |
| Task Group | LTC J. P. DRESKA | 10510 48895 | DRCDMR-TG | |
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| SA/USA Reserve | LTC G. H. CHASE | 10514 48895 | DRCSA-AR | |
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| DIRECTOR FOR INTERNATIONAL LOGISTICS DRCL | | | | |
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| US ARMY INTERNATIONAL LOGISTICS COMMAND DRSL | | | | |
| (Washington Field Office (WFO)) | | | | |
| Commander | BG(P) T. H. BRAIN | 5E22 48380 | DRSL | |
| Chief, WFO | MR. R. E. BEAN | 5E22 48383 | DRSL-W | |
| Chief of Staff | COL R. C. BUSH | 5E22 48384 | DRSL-W | |
| Mgt Control Ofc | MR. R. E. HAAG (Act) | 5E53 48391 | DRSL-SC | |
| Admin Spt Ofc | MR. E. J. COLEMAN | 5E18 48385 | DRSL-WO | |
| Directorate for Plans, Systems & Analysis | MR. F. F. BROTT | 5N16 49895 | DRSL-WS | |
| Directorate for Prog Mgt | COL S. E. HOLTOM | 5S56 48395 | DRSL-WP | |
| Directorate for Mid-East/Africa | COL D. M. BELL | 5S44 48405 | DRSL-WM | |
| Directorate for Europe | COL G. D. JONES | 5S54 48399 | DRSL-WE | |
| Directorate for Americas/Pacific/South Asia | COL C. D. FOUNTAIN | 5S22 48451 | DRSL-WA | |

| DIRECTORATE FOR MATERIEL MGT DRCLM | | | | |
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| Executive Off | LTC A. T. CONROY | 8506 48008 | DRCLM | |
| Admin Ofc & DCGAR WPC | MR. W. L. STEPHENS | 8W17 49800 | DRCLM-A | |
| Assoc Dir for Requirements & Resources (Vacancy) | | 8W22 48044 | DRCLM-R | |
| Assoc Dir for Supply & Distribution | COL O. C. GRUMMT | 8508 49272 | DRCLM-S | |
| Assoc Dir for Evaluation | MR. G. C. COX, JR. | 8N08 49785 | DRCLM-E | |
| Assoc Dir for Maintenance | COL R. D. DESCOTEAU | 8C28 49751 | DRCLM-M | |
| Programs & Projects Ofc | LTC(P) W. F. DILLON | 8S44 49487 | DRCLM-L | |

| DIRECTORATE FOR READINESS DRCRE | | | | |
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| Deputy Director | MR. H. J. BUKOWSKI | 5N58 49719 | DRCRE | |
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| Proj Off for TMDE | LTC R. MIAL | 5E08 49731 | DRCRE-T | |
| Admin Officer | MS. E. R. PLUMMER | 5N56 49756 | DRCRE-A | |
| Associate Director for Integrated Logistics Support | COL J. J. O'QUINN (Act) | 5N42 49759 | DRCRE-I | |
| Associate Director for Force Status & Customer Assistance | COL J. J. WILMES | 5N26 49890 | DRCRE-F | |
| Associate Director for Equip Improvement | MR. D. J. HAMERIK | 5N54 49750 | DRCRE-E | |

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| Assoc Dir for Cost Performance Reporting | COL R. E. FRYE, JR. | 9S36 48319 | DRCP-K | |
| Assoc Dir for Industrial Base | COL C. W. McDOWELL, JR. | 9E22 48189 | DRCP-I | |
| Assoc Dir for Procurement | COL G. E. ROYALS (Act) | 9N56 48262 | DRCP-S | |
| Assoc Dir for Procurement Mgt Review | MR. V. O. EWELL | 9S46 48178 | DRCP-P | |
| Assoc Dir for Programs | COL C. R. J. ROGERS | 9S48 48339 | DRCP-P | |
| Special Asst for Small Business | MR. R. L. COOMBS | 9N13 48185 | DRCP-Z | |

| DIRECTORATE FOR PLANS, DOCTRINE & SYS DRCP | | | | |
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| Deputy Director | MR. L. W. HOCHMEIER | 9S28 48747 | DRCP | |
| Executive Officer | MAJ C. W. MAXWELL (Act) | 9S28 48229 | DRCP | |
| Assoc Director for Plans & Doctrine | LTC H. E. DAHL (Act) | 9S37 48334 | DRCP-P | |
| Assoc Director for Systems | COL N. W. FLEMING | 9S12 48245 | DRCP-S | |
| Chief, DOD Materiel Distribution Systems Office, Hoffman Bldg. | COL C. V. SORRELS | 3N47 325-0399 | DRCP-S-D | |

| TO HEADQUARTERS, DARCOM | | | | |
|-------------------------|----------------------|-------------|---------|--|
| *United Kingdom | LTC G. J. QUIRKE | 10544 49673 | BLNO | |
| *Canada | LTC R. W. IRVINE | 10544 49679 | CLNO | |
| *Germany | COL H. ROTH | 10538 49684 | FRGNO | |
| Marine Corps | MAJ T. W. ROBERTS | 10544 49676 | DRCSG-F | |
| TRADOC/Logistics Center | LTC H. M. HAMMER | 4N09 48847 | DRCSG-L | |
| DESCOM | MR. E. G. KILPATRICK | 10W16 49620 | DRCSG-D | |

*DARCOM Point of contact for all Documents and Visits is Security Office, DARCOM Security Support Activity, Atlanta, GA, Autovon 797-5543/44

| COMMANDER'S PERSONAL STAFF DRCCG | | | | |
|----------------------------------|-----------------|-------------|-------|--|
| Executive Officer | LTC R. GANTT | 10E08 49625 | DRCCG | |
| Administrative Off | CWO H. GILMORE | 10E08 49626 | DRCCG | |
| Secretary | MISS DORA MONTA | 10E08 49626 | DRCCG | |

| DIRECTORATE FOR PERS, TNG & FORCE DEV DRCP | | | | |
|--|------------------------|------------|----------|--|
| Director | BG L. S. WRIGHT | 2E14 48195 | DRCP | |
| Deputy Director | MR. W. S. CHARIN | 2E14 48195 | DRCP | |
| Executive Off | LTC J. E. MOORE | 2E14 48195 | DRCP | |
| Plans & Admin Ofc | MR. C. W. ROHRER | 2E18 48421 | DRCP-A | |
| Civ Pers Div | MR. G. N. KELLET | 2W20 49167 | DRCP-C | |
| Force Dev Div | MR. J. B. MONG | 2E08 48215 | DRCP-S | |
| Mil Pers Div | COL B. R. ADAMS, JR. | 2S56 49325 | DRCP-M | |
| Race Relations/EO Ofc | MAJ E. L. KENNEDY | 2S55 49339 | DRCP-R | |
| Alcohol & Drug Abuse Ofc | MR. D. HELBIG | 2N38 48184 | DRCP-H | |
| STAFF SUPPORT ACTIVITIES | | | | |
| HQ Civ Pers Ofc | MR. R. VELTHUIS | 2S32 49427 | DRXMM-CO | |
| HQ Mpr Ofc | MR. P. R. ZEKAN | 2N46 48974 | DRXMM-SM | |
| HQ Mil Pers Ofc | SGM T. T. TUCKER (Act) | 2C45 49333 | DRXMM-MR | |
| HQ Race Relations/EO Ofc | LT J. E. TUCKER | 1N07 49477 | DRXMM-RR | |
| HQ Alcohol & DA Ofc | MR. D. HELBIG | 2N38 48184 | DRXMM-AD | |

| DIRECTORATE FOR QUALITY ASSURANCE DRCPA | | | | |
|---|------------------|------------|---------|--|
| Director | MR. S. J. LORBER | 4W22 48929 | DRCPA | |
| Executive Asst | MS. R. DE VEAU | 4W22 48930 | DRCPA | |
| Product Quality Div | MR. R. F. TIER | 4W20 48899 | DRCPA-P | |
| Reliability & Sys Assessment Div | MR. A. NORDSTROM | 4S06 48912 | DRCPA-E | |

| DIRECTORATE FOR PLANS & ANALYSIS DRCPA | | | | |
|--|------------------------|------------|---------|--|
| Director | COL G. T. FEILKE | 4N24 48676 | DRCPA | |
| Deputy Director | MR. D. J. SHEARIN | 4N24 48676 | DRCPA | |
| Executive Off | MAJ J. H. McCALLA | 4N24 48677 | DRCPA | |
| Environmental Quality Ofc | MR. J. S. PACE | 4N16 48192 | DRCPA-E | |
| Mil Plans & Opns Div | COL L. G. PANNIER, JR. | 4S27 49426 | DRCPA-M | |
| Mission & Org Div | MR. R. G. SILVEY | 4S18 48849 | DRCPA-O | |
| Program, Plans & Policies Div | MR. W. C. KREMANN | 4S25 48854 | DRCPA-P | |
| Sys Anal Div | COL J. A. DONNAN | 4N08 48037 | DRCPA-S | |

| DIRECTORATE FOR INSTALLATIONS & SERVICES DRCS | | | | |
|---|---------------------|------------|--------|--|
| Director | COL W. G. WOLFE | 5W12 49041 | DRCS | |
| Deputy Director | MR. J. W. BOUCHER | 5W12 49041 | DRCS | |
| Engineering Div | COL W. P. SCHILLING | 3N06 49390 | DRCS-E | |
| Housing Mgt Div | MR. R. G. McDONALD | 5W20 49282 | DRCS-H | |
| Plans & Programs Ofc | MR. J. D. HARTSOE | 5W18 49026 | DRCS-P | |
| Services Div | MR. L. H. SANDWEN | 5S06 49389 | DRCS-S | |

| EQUAL EMPLOYMENT OPPORTUNITY OFFICE DRCEE | | | | |
|---|-----------------|-------------|-------|--|
| DARCOM Equal Employment Opportunity Off | MR. G. L. JONES | 10S15 49690 | DRCEE | |
| DARCOM Fed Women's Prog Coordinator | MS. R. GNADT | 10S15 49690 | DRCEE | |
| DARCOM Spanish Speaking Prog Coordinator | MR. F. ROSARIO | 10S15 49690 | DRCEE | |

| HQ EQUAL EMPLOYMENT OPPOR OFC DRCEE | | | | |
|---|---------------------|------------|---------|--|
| HQ Equal Employment Opportunity Officer | MR. M. W. FRANCIOLI | 1C09 49836 | DRCEE-H | |
| HQ Federal Women's Program Coordinator | MRS. E. D. MANGANA | 1C09 48021 | DRCEE-H | |

| COMMANDING GENERAL | | | | |
|------------------------------------|-----------------------|---------------|--------|--|
| Deputy CG for Materiel Development | LTG G. SAMMET, JR. | 10-E-08 49625 | DRCCG | |
| Deputy CG for Materiel Readiness | LTG E. J. D'AMBROSIO | 10-N-06 49705 | DRCDMD | |
| Chief of Staff | MG H. B. GIBSON, JR. | 10-S-06 49700 | DRCDMR | |
| Deputy Chief of Staff | COL R. D. CROSBY, JR. | 10-E-14 49641 | DRCCS | |
| Command Sergeant Major | CSM H. W. SHEDD | 10-S-48 48257 | DRCCSM | |

| OFFICE OF THE COMPTROLLER DRCCP | | | | |
|--|------------------------|------------|---------|--|
| Comptroller | MR. R. H. RUHLAND | 3N58 49131 | DRCCP | |
| Deputy Compt | BG A. J. CADE | 3N58 49129 | DRCCP | |
| Executive Off | MAJ F. H. DeMARCO, JR. | 3N58 49130 | DRCCP | |
| Administrative Off | MAJ L. S. BROWN | 3N57 49124 | DRCCP-A | |
| Cost Anal Div | MR. R. R. McGREGOR | 3S34 49080 | DRCCP-E | |
| Fin & Act Div | COL E. B. FINCH, JR. | 3N54 49231 | DRCCP-F | |
| Internal Review & Audit Compliance Ofc | MR. J. K. CHURCH | 3S26 49020 | DRCCP-I | |
| Mgt Div | COL P. W. McGURU | 3W06 49171 | DRCCP-M | |
| Resources & Programs Division | MR. J. W. LOWDEN, JR. | 3E10 49029 | DRCCP-B | |
| Review & Anal Div | MR. I. BERG | 3N18 49220 | DRCCP-R | |

| OFFICE OF THE INSPECTOR GENERAL DRICG | | | | |
|---------------------------------------|--|------------|---------|--|
| Inspector General | COL M. R. WAGNER | 1S12 48070 | DRICG | |
| DARCOM Inspector General Activity | COL L. W. WRIGHT | 1S24 48084 | DRXIG-E | |
| Eastern Inspection Division | MR. R. V. MURPHY | 1S14 48072 | DRXIG-X | |
| Investigations Division | COL S. P. DOTUR | 1S08 48064 | DRXIG-V | |
| Western Inspection Division | COL C. B. HADEN, Autovon 693-3441/3442 | DRXIG-W | | |
| Administrative Officer | MRS. G. W. LEAK | 1S14 48079 | DRXIG-X | |

| HISTORICAL OFFICE DRCHO | | | | |
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| Historical Monographs/Studies | MR. C. W. LYNCH | 5S10 48173 | DRCHO | |
| Special Studies/Historical Services | MR. A. A. PUTIGNANO (Act) | 5S10 48173 | DRCHO | |
| Historical Sources | MR. M. F. COPPOLA | 5S10 49177 | DRCHO | |

| DIRECTOR OF COMM ELECTRONICS & US ARMY COMM COMMAND-DARCOM DRCE | | | | |
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| Commander | COL M. M. MOORE, JR. | 3S10 49050 | DRCE | |
| Deputy Commander | COL J. D. MITCHELL | 3S10 49055 | DRCE-DC | |
| SGT Major | SM J. CECOLI | 3S10 49056 | DRCE-SM | |
| Operations Div | A. SCHWARTZ | 3S19 49074 | DRCE-O | |
| Plans Div | J. E. GOTTFRIED | 3S06 49063 | DRCE-P | |
| Resources Div | A. E. PAIGE | 3S14 49071 | DRCE-R | |

| USA DARCOM SERVICE SUPPORT ACTIVITY DRXAM | | | | |
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| Deputy Director | MR. L. F. KORTUM | 1E14 48134 | DRXAM | |
| Admin Svc Div | LTC G. J. HAROLD | 1E10 49139 | DRXAM-A | |
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| General Services Div | CPT H. K. JENKINS | 1C09 48120 | DRXAM-G | |
| Travel | MR. J. H. BARGET | 1S46 48110 | DRXAM-GT | |
| HQ Budget & Prog Ofc | MR. V. L. GUILER (Act) | 1E18 48129 | DRXAM-B | |
| HQ Security Ofc | MRS. B. E. MILLER | 1E22 49066 | DRXAM-S | |
| Staff C-E Ofc | MAJ E. R. THOMAS II | G3C24 48989 | DRXAM-CE | |
| Staff Librarian | MS. I. O. OMDAHL | 7S35 48087 | DRXAM-L | |
| HQ Tech Library | MR. J. FRAGALE, JR. | 7S35 48152 | DRXAM-TL | |

| MISCELLANEOUS NUMBERS | | | | |
|--|------------------|-------------|--|--|
| STAFF DUTY OFFICER | G2C60 49223 | | | |
| AMBULANCE | 1S51 48296 | | | |
| (During Duty Hours, Call the Clinic) | Lobby 9-557-1144 | | | |
| (After Duty Hours, Call the Guard) | G2C60 48660 | | | |
| DARCOM OPERATIONS CENTER | G3C46 49122 | DRXIS-LH | | |
| LSSA MANAGEMENT INFORMATION CTR | 2E18 48499 | DRXMM-P | | |
| DARCOM PERS SPT AGCY | 1S34 48099 | OBM-DARCOM | | |
| BUILDING ADMINISTRATOR | 1S51 48296 | | | |
| CIVILIAN EMPLOYEE HEALTH SVC (Clinic) | G2W07 49585 | DRXAM-AMC | | |
| CLASSIFIED MAIL CENTER | 10N43 48988 | DRXAM-PA | | |
| CONFERENCE ROOM SCHEDULING | 1S17 48485 | DRXAM-PA | | |
| DRIVERS SERVICE | G2W12 48091 | DRXAM-GD | | |
| GRAPHICS FACILITY | 1C22 48491 | DRXAM-PG | | |
| GUARD OFFICE | Lobby 9-557-1144 | | | |
| HQ USACC-DARCOM | 4N16 48173 | CCNC-DC | | |
| LOCATOR SERVICE (MIL PERS) | 2C45 49339 | DRXMM-MR | | |
| LOCATOR SERVICE (CIV PERS) | 2C33 49491 | DRXMM-CO | | |
| PHOTOGRAPHIC FACILITY | 1C44 48489 | DRXAM-PP | | |
| RECEPTIONIST | Lobby 49191 | DRXAM-G | | |
| SPECIAL SECURITY OFFICE (SSO) | G2C63 48986 | DAMI-SG-DRC | | |
| TELECOMMUNICATIONS CENTER | G3C24 49009 | CCNC-CSA-OT | | |
| TELEPHONE Service Control Ofc (Mr. Ford) | G3W17 49001 | CCNC-CSA-ST | | |
| TOP SECRET REPOSITORY | G2W09 49590 | DRXAM-AMT | | |
| TRAVEL BRANCH | 1S46 48110 | DRXAM-GT | | |
| UNCLASSIFIED MAIL CENTER | G2C16 49594 | DRXAM-AMU | | |
| USA EQUIP AUTHORIZATIONS REV ACTY | 9N31 49292 | DRXEA-C | | |
| WASH PROCUREMENT OFFICE, ECOM | 4W06 48878 | DRSEL-PP-CW | | |
| DARCOM REPORTS MANAGEMENT OFFICE | 4S51 49322 | DRXIS-LB | | |

| SECRETARY OF THE GENERAL STAFF | | | | DRCCS |
|--------------------------------|-----------------------|-------|-------|---------|
| Secy General Staff | COL R. D. CROSBY, JR. | 10E14 | 49638 | DRCCS |
| Dap Secy General Staff | LTC R. T. BOYLE | 10540 | 49645 | DRCCS |
| Asst Secy General Staff | MAJ B. E. SMITH | 10554 | 49645 | DRCCS |
| Asst Secy General Staff | MAJ W. W. WINSLOW | 10554 | 49645 | DRCCS |
| Asst Secy General Staff | CPT W. S. LACY | 10554 | 49646 | DRCCS |
| Asst Secy General Staff | CPT J. K. MILLER | 10560 | 49646 | DRCCS |
| Asst Secy General Staff | 1LT J. L. LINDLEY | 10560 | 49645 | DRCCS |
| Chief, Protocol Office | MRS. H. L. SALPINI | 10550 | 49659 | DRCCS-P |
| Administrative Officer | MISS B. A. FOSTER | 10555 | 49662 | DRCCS-A |

UNCLASSIFIED



HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND

5001 EISENHOWER AVE., ALEXANDRIA, VA 22333

STAFF DIRECTORY



| OFC OF DEPUTY CG FOR MATERIEL READINESS DRCDMR | | | |
|--|----------------------|-------------|-----------|
| Asst Deputy for Mater Readiness | MR. J. F. MACLIN | 10506 49701 | DRCDMR |
| Executive Officer | COL W. G. McGRATH | 10506 49702 | DRCDMR |
| Coordinator | LTC D. G. FITZGERALD | 10510 48896 | DRCDMR-TG |
| PM Coordinator | LTC R. M. REYNOLDS | 10W18 49406 | DRCDMR-TG |
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| DIRECTOR FOR INTERNATIONAL LOGISTICS DRCL | | | |
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| Chief, WFO | MR. R. E. BEAN | 5E22 48383 | DRSL-W |
| Chief of Staff | COL R. C. BUSH | 5E22 48384 | DRSL-S |
| Mgt Control Ofc | MR. R. E. HAAG (Act) | 5533 48391 | DRSL-WC |
| Mgt Spt Ofc | MR. E. J. COLEMAN | 5E18 48385 | DRSL-WO |
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| Assoc Dir for Evaluation | MR. G. C. COX, JR. | 8N98 49785 | DRCLM-E |
| Assoc Dir for Maintenance | COL E. A. VIERECK | 8528 48786 | DRCLM-M |
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| Assoc Director for Systems | COL N. W. FLEMING | 9512 48245 | DRCPD-S |
| Chief, DOD Materiel Distribution Systems Office | COL C. V. SORRELS | 3N47 325-0399 | DRCPD-S |

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| *United Kingdom | LTC G. J. QUIRKE | 10544 49675 | BLNO |
| *Canada | LTC J. C. BEREZOWSKI | 10544 49679 | CLNO |
| *Germany | COL H. ROTHE | 10538 49684 | FRGNO |
| Marine Corps MAJ M. R. JANAY | | 10544 49676 | DRCSG-F |
| TRADOC/Logistics Center | LTC H. M. HAMMER | 10544 49678 | DRCSG-L |
| DESCOM | MR. E. G. KILPATRICK | 10W16 49620 | DRCSG-D |

*DARCOM Point of Contact for all Documents and Visits is Security Office, DARCOM Security Support Activity, Alexandria, VA, Autovon 797-3543/44

| COMMANDER'S PERSONAL STAFF DRCCG | | | |
|----------------------------------|-------------------|-------------|-------|
| Executive Officer | LTC L. K. MORASKI | 10E08 49625 | DRCCG |
| Administrative Off | CWO G. GILMORE | 10E08 49626 | DRCCG |
| Secretary | MISS DORA MONTA | 10E08 49626 | DRCCG |

| DIRECTORATE FOR PERS, TNG & FORCE DEV DRCPD | | | |
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| Deputy Director | MR. W. S. CHARIN | 2E14 48195 | DRCPD |
| Executive Off | LTC J. E. MOORE | 2E14 48195 | DRCPD |
| Plans & Admin Ofc | MR. C. W. ROHRER | 2E18 48421 | DRCPD-A |
| Civ Pers Div | MR. G. N. KELLET | 2W20 49167 | DRCPD-C |
| Force Dev Div | MR. J. B. MONG | 2E08 48215 | DRCPD-S |
| Mil Pers Div | COL B. R. ADAMS, JR. | 2556 49325 | DRCPD-M |
| Race Relations/EO Ofc | CPT J. MILLER | 2555 49138 | DRCPD-R |
| Alcohol & Drug Abuse Ofc | MR. D. HELBIG | 2N38 49716 | DRCPD-H |
| STAFF SUPPORT ACTIVITIES | | | |
| HQ Civ Pers Ofc | MR. R. VELTHUIS | 2532 49427 | DRXMM-CO |
| HQ Mpr Ofc | MR. P. R. ZEKAN | 2N46 48974 | DRXMM-SM |
| HQ Mil Pers Ofc (Vacancy) | | 2C45 49333 | DRXMM-MR |
| HQ Race Relations/EO Ofc | LT J. E. TUCKER | 1N07 49477 | DRXMM-RR |
| HQ Alcohol & DA Ofc | MR. D. HELBIG | 2N38 49716 | DRXMM-AD |
| Organizational Effectiveness Ofc | LTC R. POWELL | 2540 49837 | DRXMM-OE |

| DIRECTORATE FOR QUALITY ASSURANCE DRCPA | | | |
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| Executive Asst | MS. R. DE VEAU | 4W22 48930 | DRCPA |
| Product Quality Div | MR. R. F. TINDER | 4W20 48899 | DRCPA-P |
| Reliability & Sys Assessment Div | MR. A. NORDSTROM | 4506 48912 | DRCPA-E |

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| Deputy Director | MR. D. J. SHEARIN | 4N24 48676 | DRCPA |
| Executive Off | LTC J. M. CHAPMAN | 4N24 48676 | DRCPA |
| Environmental Quality Ofc | LTC R. M. CLEARWATER (Act) | 4N16 48191 | DRCPA-E |
| Mil Plans & Ops Div | MR. L. G. PANNIER, JR. | 4527 49426 | DRCPA-P |
| Mission & Org Div | COL R. G. SILVEY | 4518 48849 | DRCPA-O |
| Program, Plans & Policies Div | MR. W. C. KREMANN | 4525 48854 | DRCPA-P |
| Sys Anal Div | COL J. A. DONNAN | 4N08 48037 | DRCPA-S |

| DIRECTORATE FOR INSTALLATIONS & SERVICES DRCS | | | |
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| Deputy Director | MR. J. W. BOUCHER | 5W12 49041 | DRCS |
| Plans & Programs Ofc | MR. J. D. HARTSOE | 5W18 49026 | DRCS-P |
| Engineer Div | COL A. F. LAWRENCE, JR. | 5N06 49390 | DRCS-E |
| Services Div | MR. L. H. SANDWEN | 5506 49389 | DRCS-S |
| Housing Mgt Div | MR. W. H. McDONALD | 5W20 49282 | DRCS-H |

| EQUAL EMPLOYMENT OPPORTUNITY OFFICE DRCEE | | | |
|---|-----------------|-------------|-------|
| DARCOM Equal Employment Opportunity Off | MR. G. L. JONES | 10515 49690 | DRCEE |
| DARCOM Fed Women's Prog Coordinator | MS. R. GNADT | 10515 49690 | DRCEE |
| DARCOM Spanish Speaking Prog Coordinator | MR. F. ROSARIO | 10515 49690 | DRCEE |

| HQ EQUAL EMPLOYMENT OPPOR OFC DRCEE | | | |
|--|------------------------|------------|---------|
| HQ Equal Employment Opportunity Office | MR. M. W. FRANCIOSI | 1C09 49836 | DRCEE-H |
| HQ Federal Women's Program Coordinator | MS. E. D. MANGANA-SWAN | 1C09 48021 | DRCEE-H |

| DARCOM AVIATION OFFICE DRSTS-X* | | | |
|---------------------------------|-----------------|--------------|---------|
| Aviation Officer | COL D. B. KING | AVN 698-5473 | DRSTS-X |
| Flt Standardization Officer | CWO C. J. TOMEI | AVN 698-5473 | DRSTS-X |
| *Hq TSARCOM, St. Louis, MO | | 63120 | |

| LIAISON FROM HEADQUARTERS, DARCOM TO | | | |
|---|-------------------|----------|--------------|
| Hq, AF Systems Command* | MR. J. H. PROCTOR | 858-5181 | DRXFA(SDOA) |
| US Navy Weapons Center* | LTC R. F. BOYD | 245-3544 | |
| Kirtland AFB* | COL J. A. BERRIER | 964-4822 | DRXFO |
| DARCOM Liaison Office TCATA/Ft. Hood, TX | LTC C. A. BREWER | 737-1228 | DRXFS |
| Wright-Patterson AFB* | MAJ J. A. EVANS | 785-4317 | ASD/YPT-Army |
| *FOR MAILING ADDRESS, MISSION INFO, ETC., CALL OR VISIT | | | |
| DRCE-A, TEL EXT 48537, ROOM 8N55 | | | |
| 5001 EISENHOWER AVE., ALEXANDRIA, VA 22333. | | | |

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COMMERCIAL 202-274-XXXX
CABLE ADDRESS CDRDRC ALEX VA
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STAFF DUTY OFFICER
AUTOVON 284-9223
COMMERCIAL 202-274-9223
OPERATIONS CENTER 274-8660

| | | | |
|------------------------------------|-----------------------|-------------|--------|
| COMMANDING GENERAL | GEN J. R. GUTHRIE | 10E08 49625 | DRCCG |
| Deputy CG for Materiel Development | LTG R. J. BAER | 10N06 49705 | DRCDMD |
| Deputy CG for Materiel Readiness | LTG E. J. D'AMBROSIO | 10S06 49700 | DRCDMR |
| Chief of Staff | MG H. B. GIBSON, JR. | 10E14 49641 | DRCCS |
| Deputy Chief of Staff | COL R. D. CROSBY, JR. | 10E14 49638 | DRCCS |
| Command Sergeant Major | CSM H. W. SHEDD | 10S48 48257 | DRCCSM |

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|--|-----------------------|------------|---------|
| Comptroller | BG A. J. CADE (Act) | 3N58 49131 | DRCCP |
| Deputy Compt | COL J. W. LOWDEN, JR. | 3N58 49129 | DRCCP |
| Sp Asst for Fin Mgt | MR. B. R. GILLILAND | 3N58 49129 | DRCCP |
| Executive Off | LTC T. K. HIGHTOWER | 3N58 49130 | DRCCP |
| Administrative Off | MRS. L. S. BROWN | 3N57 49120 | DRCCP-A |
| Cost Anal Div | MR. R. R. MCGREGOR | 3534 49080 | DRCCP-E |
| Fin & Act Div | COL E. B. FINCH, JR. | 3N54 49231 | DRCCP-F |
| Internal Review & Audit Compliance Ofc | MR. J. K. CHURCH | 3526 49020 | DRCCP-I |
| Mgt Div | (Vacancy) | 3W06 49170 | DRCCP-M |
| Resources & Prog Div | COL J. W. LOWDEN, JR. | 3E10 49039 | DRCCP-B |
| Review & Anal Div | MR. I. BERG | 3N18 49220 | DRCCP-R |

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|---------------------------------------|--|------------|---------|
| Inspector General | COL M. R. WAGNER | 1512 48070 | DRCCG |
| DARCOM Inspector General Activity | | | |
| Eastern Inspection Division | COL L. W. WRIGHT | 1524 48084 | DRCCG-E |
| Coordination & Control Division | MR. R. V. MURPHY | 1514 48072 | DRCCG-X |
| Investigations Division | COL S. P. DOTUR | 1508 48064 | DRCCG-V |
| Western Inspection Division | COL C. B. HADEN, Autovon 693-3441/3442 | DRCCG-W | |
| Administrative Officer | MRS. G. W. LEAK | 1514 48079 | DRCCG-X |

| HISTORICAL OFFICE DRCHO | | | |
|---|---------------------------|------------|-------|
| Chief | DR. D. BIRSELL | 5510 49177 | DRCHO |
| Annual Historical Report/Unit Histories | MR. M. G. MARKEN, SR. | 5510 48173 | DRCHO |
| Historical Monographs/Studies | MR. C. W. LYNCH | 5510 48173 | DRCHO |
| Special Studies/Historical Services | MR. A. A. PUTIGNANO (Act) | 5510 48173 | DRCHO |
| Historical Sources | MR. M. F. COPPOLA | 5510 49177 | DRCHO |

| DIRECTOR OF COMM ELECTRONICS & US ARMY COMM COMMAND-DARCOM DRCEE | | | |
|--|-----------------------|------------|---------|
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| Commander | COL H. S. CHRISTENSEN | 3510 49050 | CCNC-C |
| Deputy Commander | COL J. D. MITCHELL | 3510 49055 | CCNC-DC |
| SGT Major | SGM J. CECCOLI | 3510 49056 | CNC-S |
| Operations Div | MR. A. SCHWARTZ | 3519 49073 | DRCEE-O |
| Plans Div | MR. J. E. GOTTFRIED | 3506 49063 | DRCEE-P |
| Resources Div | MR. A. E. PAIGE | 3514 49071 | DRCEE-R |

| USA DARCOM SERVICE SUPPORT ACTIVITY DRXAM | | | |
|---|-----------------------|-------------|----------|
| Director | LTC J. A. VOETSCH III | 1E14 48134 | DRXAM |
| Deputy Director | MR. L. F. KORTUM | 1E14 48134 | DRXAM |
| Admin. Svc Div | LTC G. J. HAROLD | 1E10 48139 | DRXAM-A |
| Mail Management | MR. J. W. HENDERSON | G2C08 48341 | DRXAM-AM |
| Printing & Publications | MR. H. S. JOHNSON | 1E10 48141 | DRXAM-AB |
| Records Administration | MR. E. M. THORNE, JR. | 1E06 49141 | DRXAM-AP |
| Audio-Visual Presentations Div | MR. B. W. ADKINS | 1C13 48481 | DRXAM-P |
| Gen. Services Div | 2LT S. D. POST | 1552 49005 | DRXAM-G |
| Space & Sup | MR. P. SIMS | 1558 49095 | DRXAM-G |
| Equip Mgr | MR. J. BALDWIN | 1558 49094 | DRXAM-G |
| Travel | MR. J. H. BARGET | 1552 49006 | DRXAM-GT |
| HQ Budget & Prog Ofc | MR. V. L. GUILER | 1E18 48129 | DRXAM-B |
| HQ Security Ofc | MRS. B. E. MILLER | 1E22 49066 | DRXAM-S |
| Staff C-E Ofc | CPT G. W. PERKINS | G3C20 48989 | DRXAM-CE |
| Staff Librarian | MS. I. O. OMDALL | 7535 48087 | DRXAM-L |
| HQ Tech Library | MR. J. FRAGALE, JR. | 7535 48152 | DRXAM-TL |

| MISCELLANEOUS | | NUMBERS |
|--|-------|------------|
| STAFF DUTY OFFICER | G2C60 | 49223 |
| AMBULANCE | | |
| (During Duty Hours, Call the Clinic) | 1551 | 48296 |
| (After Duty Hours, Call the Guard) | Lobby | 9-557-1144 |
| DARCOM OPERATIONS CENTER | G2C60 | 48660 |
| ISSA MANAGEMENT INFORMATION CTR | G3C46 | 49122 |
| DARCOM PERS SPT AGCY | 2E18 | 48499 |
| BUILDING ADMINISTRATOR | 1534 | 48099 |
| CIVILIAN EMPLOYEE HEALTH SVC (Clinic) | 1551 | 48296 |
| CLASSIFIED MAIL CENTER | G2W07 | 49585 |
| COMMAND CONFERENCE ROOM | 10N48 | 48988 |
| CONFERENCE ROOM SCHEDULING | 1517 | 48485 |
| CREDIT UNION/DARCOM | 7C22 | 48311 |
| DRIVERS SERVICE | G2W12 | 48091 |
| GRAPHICS FACILITY | 1C22 | 48491 |
| GUARD OFFICE | Lobby | 9-557-1144 |
| HQ USAC-DARCOM | 4N16 | 48173 |
| LOCATOR SERVICE (MIL PERS) | 2C45 | 49339 |
| LOCATOR SERVICE (CIV PERS) | 2C33 | 49491 |
| PHOTOGRAPHIC FACILITY | 1C44 | 48489 |
| PRINTING & DUPLICATING | G2C37 | 49603 |
| PUBLICATIONS & EDITORIAL SEC | 1E06 | 48149 |
| PUBLICATIONS STOCK ROOM | G3C21 | 49663/4 |
| RECEPTIONIST | Lobby | 49191 |
| SPECIAL SECURITY OFFICE (SSO) | G2C63 | 48986 |
| TELECOMMUNICATIONS CENTER | G3C24 | 49009 |
| TELEPHONE Service Control Off (Mr. Ford) | G3W17 | 49001 |
| TOP SECRET REPOSITORY | G2W09 | 49590 |
| UNCLASSIFIED MAIL CENTER | G2C16 | 49594 |
| USA EQUIP AUTHORIZATIONS REV ACTV | 9N31 | 49272 |
| WASH PROCUREMENT OFFICE, ECOM | 4W06 | 48898 |
| DARCOM REPORTS MANAGEMENT OFFICE | 4551 | 49322 |
| FORMS MANAGEMENT OFFICER | 1N58 | 49141 |

DARCOM HEADQUARTERS STAFF

OFFICE OF THE DEPUTY CG FOR MATERIEL READINESS

| | | |
|--------------------------------|----------------------|----------|
| Asst Deputy/Materiel Readiness | Mr. J. F. MacIn | 274-9701 |
| Executive Officer | COL W. B. McGrath | 274-9702 |
| PM Coordinator | LTC R. M. Reynolds | 274-9406 |
| Task Group | LTC W. S. Flynn | 274-8895 |
| SR Adv/US ARNG | COL J. Keeling | 274-8895 |
| SR Adv/US Reserve | COL G. H. Chase | 274-8895 |
| Sp Asst/Nuclear Surety | Mr. R. L. Miller | 274-9554 |
| Sp Asst/Chemical Surety | MAJ K. Miller | 274-9610 |
| Coordinator | LTC D. G. Fitzgerald | 274-8896 |

COMMAND GROUP

| | | | |
|--|------------------------------|----------------|-----------------|
| COMMANDING GENERAL | GEN JOHN R. GUTHRIE | 10-E-08 | 274-9625 |
| DEPUTY CG FOR MATERIEL READINESS | LTG E. J. D'AMBROSIO | 10-S-06 | 274-9700 |
| DEPUTY CG FOR MATERIEL DEVELOPMENT | LTG R. J. BAER | 10-N-06 | 274-9705 |
| CHIEF OF STAFF | MG H. B. GIBSON, JR. | 10-E-14 | 274-9641 |
| DEPUTY CHIEF OF STAFF & SECY OF THE GENERAL STAFF | COL R. D. CROSBY, JR. | 10-E-14 | 274-9638 |
| COMMAND SERGEANT MAJOR | CSM H. W. SHEDD | 10-S-48 | 274-8257 |

OFFICE OF THE DEPUTY CG FOR MATERIEL DEVELOPMENT

| | | |
|----------------------------------|-------------------------|----------|
| Asst Deputy/Materiel Development | Mr. J. D. Blanchard | 274-9709 |
| Asst Deputy/Science & Technology | Mr. N. L. Klein | 274-9560 |
| Asst Deputy/Int'l R&D | Mr. B. R. Dunetz | 274-8252 |
| Executive Officer | LTC F. W. McDonald, Jr. | 274-9711 |
| Sp Asst for Minor Programs | Mr. J. Stolarick | 274-9559 |
| Task Group | LTC A. D. Rodgers, III | 274-8657 |

DIRECTOR FOR SECURITY ASSISTANCE

BG(P) T. H. Brain 274-8380

DIRECTORATE FOR MATERIEL MANAGEMENT

BG E. A. VULEY, JR. 274-8175

DIRECTORATE FOR READINESS

MG E. L. Konopnicki 274-9718

DIRECTORATE FOR PROCUREMENT & PRODUCTION

BG(P) J. W. Sharp 274-8159

DIRECTORATE FOR PLANS, DOCTRINES & SYSTEMS

COL R. C. Hawik 274-8229

LIAISON

TO HEADQUARTERS, DARCOM

| | | |
|-------------------|----------------------|----------|
| *United Kingdom | LTC G. J. Quirke | 274-9675 |
| *Canada | LTC J. C. Berezowski | 274-9679 |
| *Germany | COL H. R. Rother | 274-9684 |
| Marine Corps | MAJ M. R. Janay | 274-9676 |
| TRADOC/Log Center | LTC H. M. Hammer | 274-9678 |
| DESCOM | Mr. E. G. Kilpatrick | 274-9620 |

*DARCOM point of contact for all documents and visits is Security Office, DARCOM Security Support Activity, Atlanta, GA — Autovon 797-5543/44

FROM HEADQUARTERS, DARCOM TO

| | | |
|-------------------------|-------------------|----------|
| *HQ, AF Systems Command | Mr. J. H. Proctor | 858-6181 |
| *US Navy Weapons Center | LTC R. F. Boyd | 245-3544 |
| *Kirtland AFB | COL J. A. Barrier | 964-4822 |
| DARCOM Liaison Office | LTC C. A. Brewer | 737-1228 |
| TCATA/Ft Hood, TX | | |
| *Wright-Patterson AFB | MAJ J. A. Evans | 785-4317 |

*For mailing address, mission info, etc., call or visit DRCDE-A, 274-8537 Room 8N55, 5001 Eisenhower Ave., Alexandria, VA 22333

DIRECTORATES

DIRECTOR OF COMMUNICATIONS/ELECTRONICS & US ARMY COMMUNICATIONS COMMAND — DARCOM

COL H. S. Christensen 274-9050

DIRECTORATE FOR INSTALLATIONS & SERVICES

COL W. G. Wolfe 274-9041

DIRECTORATE FOR MANAGEMENT INFORMATION SYSTEMS

Mr. J. C. Gilbert 274-8626

DIRECTORATE FOR PERSONNEL, TRAINING & FORCE DEVELOPMENT

BG L. R. Forney, Jr. 274-8195

DIRECTORATE FOR PLANS & ANALYSIS

COL G. T. Feilke 274-8676

DIRECTORATE FOR QUALITY ASSURANCE

Mr. S. J. Lorber 274-8929

OFFICES

OFFICE OF THE CHAPLAIN

COL D. L. Wilson 274-9432

OFFICE OF THE COMMAND COUNSEL

Mr. F. X. McKenna 274-8046

OFFICE OF THE COMPTROLLER

BG A. J. Code (Adg) 274-9131

EQUAL EMPLOYMENT OPPORTUNITY OFFICE

Mr. G. L. Jones 274-9690

HISTORICAL OFFICE

Dr. D. Birdsell 274-9177

OFFICE OF THE INSPECTOR GENERAL

COL M. R. Wagner 274-8070

PUBLIC AFFAIRS OFFICE

COL C. A. Hammaker, Jr. 274-8010

SAFETY OFFICE

Mr. W. G. Queen 274-9475

SECURITY OFFICE

COL J. A. Barry 274-9454

SERVICE SUPPORT ACTIVITY

LTC J. A. Voetsch, III 274-8134

OFFICE OF THE SURGEON

COL R. T. Cutting, MD 274-9470

DIRECTORATE FOR DEVELOPMENT & ENGINEERING

MG Robert J. Lunn 274-9490

DIRECTORATE FOR BATTLEFIELD SYSTEMS INTEGRATION

MG I. A. Hunt, Jr. 274-9112

OFFICE OF PROJECT MANAGEMENT

COL L. M. Eek, Jr. 274-9571

OFFICE OF INTERNATIONAL RESEARCH & DEVELOPMENT

COL R. J. Cuthbertson 274-8367

OFFICE OF MANUFACTURING TECHNOLOGY

COL N. Vinson 274-8298

OFFICE OF PRODUCT IMPROVEMENT

COL L. A. Gimple 274-9200

OFFICE OF LABORATORY & DEVELOPMENT COMMAND MANAGEMENT

Mr. J. Lindworm 274-9566

SPECIAL ASSISTANTS

| | | |
|-----------------------|-------------------|----------|
| Congressional Affairs | Mr. C. R. Smith | 274-8263 |
| Joint Activities | COL C. Henne, Jr. | 274-9695 |
| Technical Relations | Mr. H. Handler | 274-9630 |

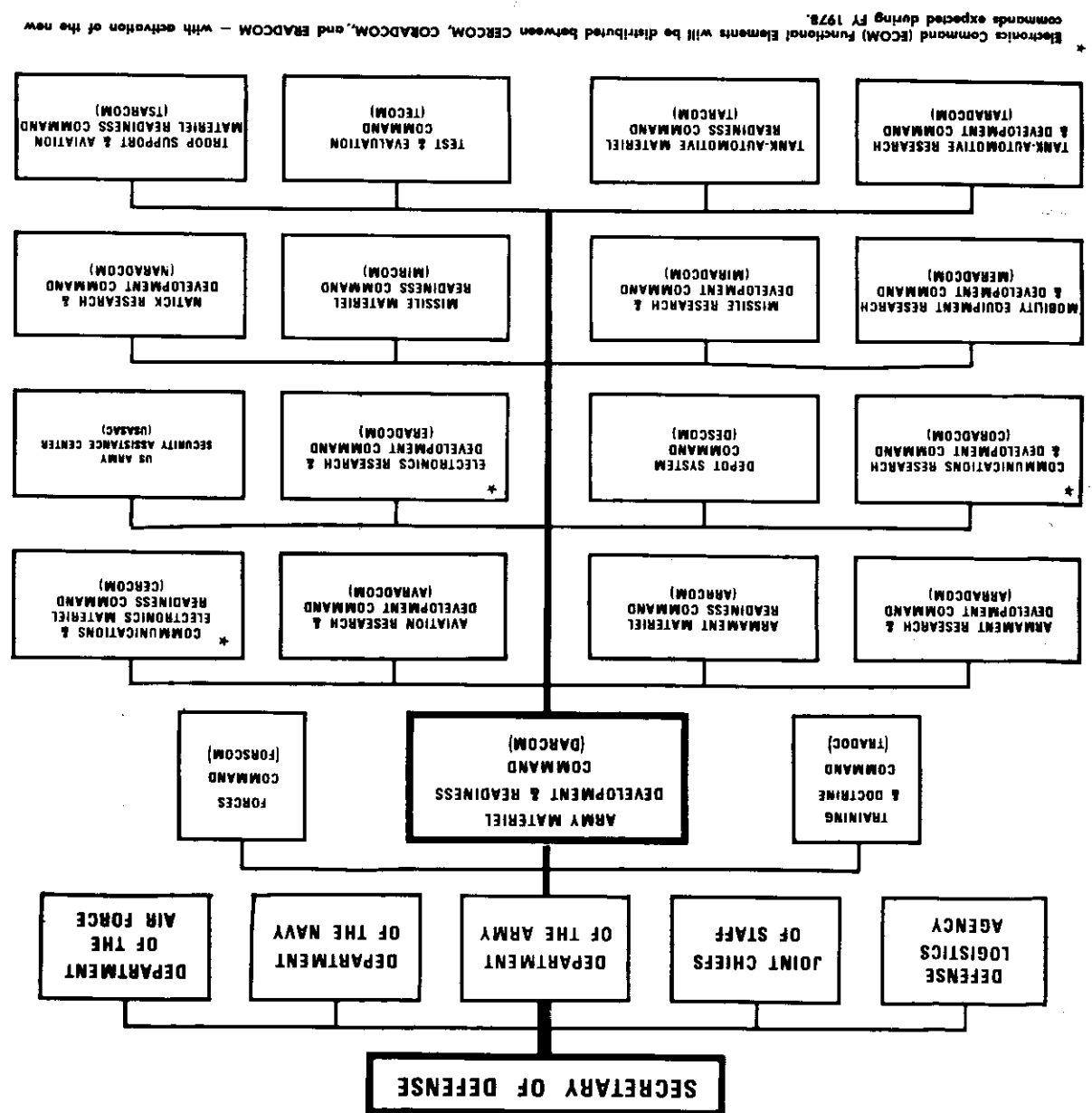
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NOVEMBER 1977

HEADQUARTERS
UNITED STATES ARMY MATERIEL
DEVELOPMENT & READINESS COMMAND
5001 EISENHOWER AVENUE
ALEXANDRIA, VA 22333
CABLE ADDRESS - CORDRC ALEX VA
AUTOVON 284 XXXX



MISSION RESPONSIBILITIES FOR ERADCOM, CORADCOM AND CERCOM WILL BE SHOWN ON NEXT EDITION OF THIS CHART.

| MAJOR SUBORDINATE COMDS | MISSIONS RESPONSIBILITY | | | | | | | | | | | | | | | |
|-------------------------|-------------------------|--------|-------------------------|-------------------------|------------------------|-----------------------------|---------------------|-------------|------------------------------|----------------------------|-------------------------|--------------------|--------------------------|-------------------------|----------------------|-------------------------|
| | RESEARCH | DESIGN | ENGINEER DESIGN TESTING | GOVT VALIDATION TESTING | USER TESTING (SUPPORT) | PROD/POST PROD TEST SUPPORT | MATERIEL EVALUATION | PROCUREMENT | CATALOGING & STANDARDIZATION | PRODUCT & PRODUCTION ENGRS | MAINTENANCE ENGINEERING | NEW EQUIP TRAINING | WHOLESALE INVENTORY MGMT | SUPPLY & FINANCIAL MGMT | TECHNICAL ASSISTANCE | INDUSTRIAL MOBILIZATION |
| ARRADCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ARRCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| AVRADCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CERCOM * | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CORADCOM * | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DESCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ERADCOM * | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| USASAC | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| MERADCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| MIRADCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| MIRCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NARADCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| TARADCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| TARCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| TECOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| TSARCOM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ECOM * | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Manage the wholesale materiel activities of the Army. Provide supply and maintenance support to the Army -- and to other customers. Assist in the formulation of the Army materiel program and implement that program.

MAJOR SUBORDINATE COMMAND RESPONSIBILITIES

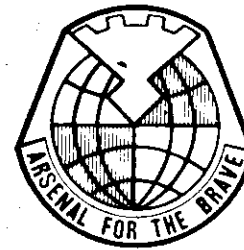
Primary mission responsibilities of major subordinate commands listed inside of this guide are outlined below:

MISSION U.S. ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND

UNITED STATES ARMY MATERIEL DEVELOPMENT & READINESS COMMAND ORGANIZATION AND MISSIONS



UNCLASSIFIED DARCOM FIELD ELEMENTS



MATERIEL READINESS

OTHER ELEMENTS

RESEARCH & DEVELOPMENT

US ARMY ARMAMENT MATERIEL READINESS COMMAND, ROCK ISLAND, IL (ARRCOM)
MG W. E. EICHER

Installations/Activities
*USA Watervliet Arsenal
*USA Rock Island Arsenal
*USA Pine Bluff Arsenal
*Rocky Mountain Arsenal
USA Ammunition Center
Central Ammo Mgt Ofc Pacific (CAMO)

Fld Svcs Activity/ARRCOM
Joint Convl Ammo* Prog Coord Group (JCAP-CG)
USA Tech Escort Unit
Crane Army Ammo Activity

(28) GOCO Ammo Plants
Alabama, Childersburg, AL
Cornhusker, Grand Island, NB
Holston, Kingsport, TN
Indiana, Charlestown, IN
Iowa, Middletown, IA
Kansas, Parsons, KS
Lake City, Independence, MO
Lone Star, Texarkana, TX
Louisiana, Shreveport, LA
Milan, Milan, TN
Radford, Radford, VA
Badger, Baraboo, WI
Longhorn, Marshall, TX
Sunflower, Lawrence, KS

Joliet, Joliet, IL
St. Louis, St. Louis, MO
Gateway, St. Louis, MO
Twin Cities, Minneapolis, MN
Ravenna, Ravenna, OH
Riverbank, Riverbank, CA
Volunteer, Chattanooga, TN
Scranton, Scranton, PA
Burlington, Burlington, NJ
Hays, Pittsburgh, PA
Hawthorne, Hawthorne, NV
McAlester, McAlester, OK
Newport, Newport, IN
Phosphate Dev Wks, Muscle Shoals, AL

Zip Code 61201
Area Code 309
Tel. 794-5111
Autovon 793-5111

US ARMY COMMUNICATIONS & ELECTRONICS MATERIEL READINESS COMMAND, FT. MONMOUTH, NJ (CERCOM)
MG J. K. STONER, JR.

Installations/Activities
HQ Instl Support Activity/CERCOM
TV-AUDIO Support Activity
Comm Security Logistics Activity
241st MP Co.
389th USA Band

Zip Code 07703
Area Code 201
Tel. 532-1515
Autovon 992-1515

US ARMY MISSILE MATERIEL READINESS COMMAND, REDSTONE ARSENAL, AL (MIRCOM)
MG L. RACHMELER

Installations/Activities
Redstone Arsenal Support Activity (RSA)
US Army Metrology and Calibration Center
Field Services Activity/MIRCOM
291st MP Co
95th Svc Co/Calib

Zip Code 35809
Area Code 205
Tel. 876-2101
Autovon 746-2101

US ARMY TANK-AUTOMOTIVE MATERIEL READINESS COMMAND, WARREN, MI (TARCOM)
MG H. F. HARDIN, JR.

Installations/Activities
USA Mod Cen Lima, OH
Field Service Actv/TARCOM
USA TARCOM Support Actv Selfridge, MI
HQ & Instl Spt Actv/TARCOM

Zip Code 48090
Area Code 313
Tel. 573-1131
Autovon 2733-1132

US ARMY TROOP SUPPORT AND AVIATION MATERIEL READINESS COMMAND, ST. LOUIS, MO (TSARCOM)
MG R. H. THOMPSON

Installations/Activities
USA Support Activity, Phila, PA
USA Gen Mat & Petr Actv (GMPA)
St. Louis Area Support Center
Field Svc Activity
Admin and Instl Support Actv

Zip Code 63120
Area Code 314
Tel. 263-2201
Autovon 693-2201

PROGRAM/PROJECT/PRODUCT MANAGERS

| | | | |
|--|--------------------------|-------------------|------------------|
| Advanced Attack Helicopter (AAH) | COL(P) E. M. Browne | St. Louis, MO | Autovon 698-2927 |
| Aircraft Survivability Equipment (ASE) | COL J. L. Keaton | St. Louis, MO | 698-3961 |
| Amphibians and Watercraft (AWC) | LTC Walter V. Pope | St. Louis, MO | 693-2361 |
| Armored Combat Vehicle Technology (ACVT) | LTC R. L. Catron | Warren, MI | 273-1360 |
| Army Container Oriented Distribution System (ACODS) | COL W. H. Danzeisen, Jr. | Alexandria, VA | 284-8799 |
| Army Gun Air Defense Systems (ARGADS) | COL L. S. Marrella | Dover, NJ | 880-2271 |
| Army Tactical Communications Systems (ATACS) | COL W. V. Paul, Jr. | Ft. Monmouth, NJ | 992-2109 |
| Army Tactical Data Systems (ARTADS) | BG D. R. Lasher | Ft. Monmouth, NJ | 992-4612 |
| Automatic Test Support Systems (ATSS) | LTC W. J. Gabrysiak | Ft. Monmouth, NJ | 992-1759 |
| BLACK HAWK | COL R. D. Kenyon | St. Louis, MO | 698-3831 |
| Cannon Artillery Weapons Systems (CAWS) | COL R. E. Phillip | Dover, NJ | 880-2572 |
| CH-47 Modernization Program | COL J. M. Hesson | St. Louis, MO | 698-3984 |
| Chapparral/FAAR | COL H. E. Stubbs | Redstone Ars., AL | 746-6130 |
| Chemical Demilitarization and Installation Restoration | COL F. A. Jones | Aberdeen PG, MD | 584-4467 |
| COBRA | COL R. P. St. Louis | St. Louis, MO | 698-2331 |
| Control & Analysis Ctrs | COL T. D. Sargent | Arlington, VA | 222-5165 |
| COPPERHEAD (CLGP) | LTC R. A. Nulk | Dover, NJ | 880-2122 |
| DCS (Army) Communications Systems | BG E. Paige, Jr. | Ft. Monmouth, NJ | 992-5101 |
| FAMECE and UET | COL M. B. Scheider | Ft. Belvoir, VA | 354-1116 |

US ARMY DEPOT SYSTEM COMMAND, CHAMBERSBURG, PA (DESCOM)
MG R. L. BERGQUIST

Installations/Activities
*USA Depot Anniston, AL
*USA Depot Corpus Christi, TX
*USA Depot Lettkenney, PA
*USA Depot Mainz, Germany
*USA Depot New Cumberland, PA
*USA Depot Red River, Texarkana, TX
*USA Depot Sacramento, CA
*USA Depot Seneca, Romulus, NY
*USA Depot Sharpe, Lathrop, CA
*USA Depot Sierra, Herlong, CA
*USA Depot Tobyhanna, PA
*USA Depot Tooele, UT

Lexington-Blue Grass Army Depot Activity, KY
Navajo Army Depot Activity, Flagstaff, AZ
Ober Ramstadt Army Depot Activity, Ober Ramstadt, Germany
Pueblo Army Depot Activity, CO
Savanna Army Depot Activity, IL
Umatilla Army Depot Activity, Hermiston, OR
Fort Wingate Army Depot Activity, Gallup, NM

Zip Code 17201
Area Code 717
Tel. 263-6400
Autovon 242-6400/1110

US ARMY SECURITY ASSISTANCE CENTER ALEXANDRIA, VA (USASAC)
BG(P) T. H. BRAIN

Installations/Activities
None

Zip Code 22333
Area Code 202
Telephone 274-8383
Autovon 284-8380

US ARMY TEST AND EVALUATION COMMAND, ABERDEEN PROVING GROUND, MD (TECOM)
MG P. W. POWERS

Installations/Activities
*USA Aberdeen Proving Ground, MD
*USA Dugway Proving Ground, UT
*USA Yuma Proving Ground, AZ
*USA Jefferson Proving Ground, IN
USA Electronics Proving Ground
USA Cold Regions Test Center
USA Tropic Regions Test Center

USA Aircraft Development Test Actv
*White Sands Missile Range
523rd MP Co
259th MP Co
65th MP Plt
White Sands Missile Range Troop Comd

Zip Code 21005
Area Code 301
Tel. 278-4374
Autovon 283-4374

SEPARATE INSTALLATIONS AND ACTIVITIES UNDER HEADQUARTERS, DARCOM

| | |
|--|------------------|
| USA Central TMDE Activity, Lexington, KY 40511 | Autovon 745-3206 |
| USA DARCOM Automated Log Mgt Sys Activity, St. Louis, MO 63101 | 268-6044 |
| USA DARCOM Aviation Office, HQ, TSARCOM, St. Louis, MO 63120 | 698-5473 |
| USA DARCOM Catalog Data Activity, New Cumberland, PA 17070 | 977-6600 |
| USA DARCOM Field Ofc, Hq AF Sys Cmd, USAF, Andrews AFB, Washington, DC 20334 | 858-5181 |
| USA DARCOM Field Safety Activity, Charleston, IN 47111 | 366-XXXXXX |
| USA DARCOM Inspector General Activity, Alexandria, VA 22333 | 284-8072 |
| USA DARCOM Installations and Services Activity, Rock Island, IL 61201 | 793-5018 |
| USA DARCOM Liaison Ofc/TCATA Ft. Hood, TX 76544 | 586-5701 |
| USA DARCOM Log Control Activity, Presidio of San Francisco, CA 94129 | 242-6589 |
| USA DARCOM Log Systems Spt Activity, Chambersburg, PA 17201 | 745-4237 |
| USA DARCOM Maintenance Mgt Center, Lexington, KY 40511 | 284-8195 |
| USA DARCOM Personnel Spt Activity, Alexandria, VA 22333 | 745-3449 |
| USA DARCOM QA Field Activity, Lexington, KY 40507 | 797-5621 |
| USA DARCOM Security Support Activity, Forest Park, GA 30050 | 880-5196 |
| USA DARCOM Surety Field Activity, Dover, NJ 07801 | 274-8878 |
| *USA ECOM Washington Procurement Ofc, Alexandria, VA 22333 | 249-6701 |
| *USA Electronics Materiel Readiness Activity, Vint Hills Farm Sta, Warrenton, VA 22186 | 284-9292 |
| USA Equip Auth Rev Activity, Alexandria, VA 22333 | 274-7110 |
| USA Foreign Science and Technology Center, Charlottesville, VA 22901 | 283-3883 |
| USA Human Engr Lab, Aberdeen PG, MD 21005 | 793-5010 |
| USA Industrial Base Engr Activity, Rock Island Arsenal, IL 61201 | 687-4424 |
| USA Log Mgt Center, Ft. Lee, VA 23801 | 799-6043 |
| USA Mgt Engr Tng Activity, Rock Island, IL 61201 | 955-3275 |
| *USA Materiel & Mechanics Resch Center, Watertown, MA 02172 | 870-2432 |
| USA Mat Sys Anal Activity, Aberdeen PG, MD 21005 | 935-3331 |
| USA Procurement Activity, Hawaii, Fort Shafter, HI 96858 | |
| *USA Research Ofc, Research Triangle Park, Durham, NC 27709 | |
| USA Research & Sdzn Gp/Europe, Box 65, London, England, APO New York 09510 | |
| USA Register of DARCOM Career Interns, Alexandria, VA 22333 | 284-8501 |
| USA Satellite Comm Agency, Ft. Monmouth, NJ 07703 | 992-1228 |
| USA Space Program Ofc, Alexandria, VA 22333 | 284-8774 |
| USA Standardization Gp/Australia, Canberra Australia, APO San Francisco 96404 | |
| USA Standardization Gp/Canada, Ottawa 4 Canada | |
| USA Ofc Test Dir Joint Svcs Electro-Optical Guided Weapons Countermeasures | |
| Test Program, White Sands Missile Range, NM 88002 | 258-1134 |
| Joint Mil Packaging Tng Center, Aberdeen PG, MD 21005 | 283-4451 |

US ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND, DOVER, NJ (ARRADCOM)
MG B. L. LEWIS

Installations/Activities
Ballistic Research Laboratory
*Chemical Systems Laboratory
ARRADCOM Picatinny Arsenal Support Activity

Zip Code 07801
Area Code 201
Tel. 328-3200
Autovon 880-3200

US ARMY AVIATION RESEARCH AND DEVELOPMENT COMMAND, ST. LOUIS, MO (AVRADCOM)
MG S. C. STEVENS

Installations/Activities
Hughes Plant Activity
USA Avn Engr Flight Activity
Bell Plant Activity
*USA Air Mobility R&D Lab
USA Boeing-Vertol Plant Activity
USA Avionics Agency and Lab

Zip Code 63166
Area Code 314
Tel. 268-2201
Autovon 698-2201

US ARMY COMMUNICATIONS RESEARCH AND DEVELOPMENT COMMAND, FT. MONMOUTH, NJ (CORADCOM)
MG H. DICKINSON

Installations/Activities
CORADCOM Test Facility
Center for Tactical Computer Sciences (CENTACS)
Center for Communications Systems (CENCOMS)
Battlefield Systems Integration Center (BSICEN)

Zip Code 07703
Area Code 201
Tel. 532-4612
Autovon 992-4612

US ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND, ADELPHI, MD (ERADCOM)
MG C. D. DANIEL, JR.

Installations/Activities
ERADCOM Technical Support Activity
Aviation Flight Test Activity
Signals Warfare Lab
*Harry Diamond Lab
Combat Survey & Target Acquisition Lab

Electronic Warfare Lab
Atmospheric Science Lab
Electronic Technical & Devices Lab
Night Vision Lab

Zip Code 20783
Area Code 202
Tel. 394-1600
Autovon 290-1600

US ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT COMMAND, FT. BELVOIR, VA (MERADCOM)
COL B. C. HUGHES

Installations/Activities
None

Zip Code 22060
Area Code 703
Tel. 664-4996
Autovon 354-4996

US ARMY MISSILE RESEARCH AND DEVELOPMENT COMMAND, REDSTONE ARSENAL, AL (MIRADCOM)
MG C. F. MEANS

Installations/Activities
Missile Intelligence Agency

Zip Code 35809
Area Code 205
Tel. 876-7128
Autovon 746-7128

US ARMY NATICK RESEARCH AND DEVELOPMENT COMMAND, NATICK, MA (NARADCOM)
COL H. F. PENNEY

Installations/Activities
None

Zip Code 01760
Area Code 617
Tel. 653-1000 Ext. 2-2/5
Autovon 955-2001

US ARMY TANK-AUTOMOTIVE RESEARCH AND DEVELOPMENT COMMAND, WARREN, MI (TARADCOM)
MG O. C. DECKER, JR.

Installations/Activities
None

Zip Code 48090
Area Code 313
Tel. 573-2144
Autovon 273-2144

| | | | |
|---|----------------------|-------------------|----------|
| Fighting Vehicle Armament | COL R. W. Spotts | Warren, MI | 273-2632 |
| Fighting Vehicle Systems | BG S. R. Sheridan | Warren, MI | 273-1630 |
| FIREFINDER | COL T. F. Cameron | Ft. Monmouth, NJ | 996-5324 |
| General Support Rocket System | COL B. P. Masters | Redstone Ars., AL | 746-1195 |
| Ground Laser Designators | COL B. J. Pellegrini | Redstone Ars., AL | 746-4462 |
| HAWK | COL H. C. Whitaker | Redstone Ars., AL | 746-5609 |
| Heavy Equipment Transporter (HET) | COL R. W. Pointer | Warren, MI | 369-2637 |
| HELLFIRE | COL R. J. Feist | Redstone Ars., AL | 746-1117 |
| High Energy Laser System | COL D. H. Lueders | Redstone Ars., AL | 746-2382 |
| Improved Tow Vehicle | COL C. C. Adsit | Warren, MI | 273-2069 |
| Iranian Aircraft Program (IAP) | COL E. M. Aguanno | St. Louis, MO | 698-3741 |
| Kuwait Missile System | COL M. J. Small | Redstone Ars., AL | 746-3196 |
| LANCE | COL D. P. Whalen | Redstone Ars., AL | 746-6144 |
| M60 Tank Development | COL R. E. Butler | Warren, MI | 273-2831 |
| M60 Tank Production | COL R. H. Sawyer | Warren, MI | 273-2720 |
| M110E2 8" Howitzer | LTC N. R. Hurst | Rock Island, IL | 793-4308 |
| M113/M113A1 Family of Vehicle Readiness | COL F. Hisson, Jr. | Warren, MI | 369-2477 |
| Mobile Electric Power | COL A. G. Rowe | Springfield, VA | 354-3031 |
| Multi-Service Communications Systems | COL A. F. Albright | Ft. Monmouth, NJ | 993-2249 |
| Munitions Production Base Modernization & Expansion | BG J. S. Egbert | Dover, NJ | 880-3207 |

| | | | |
|---|-------------------------|-------------------|----------|
| Navigation Control Systems (NAVCOM) | COL L. White | Ft. Monmouth, NJ | 992-4240 |
| Nuclear Munitions | COL J. H. Sloan | Dover, NJ | 880-5342 |
| PATRIOT | MG O. D. Street, III | Redstone Ars., AL | 742-3240 |
| PERISHING | COL L. H. Hunt | Redstone Ars., AL | 746-1165 |
| Remotely Monitored Battlefield Sensor Systems (REMBASS) | COL L. C. Friedersdorff | Ft. Monmouth, NJ | 992-4541 |
| 2.75 Rocket System | COL J. L. Tow | Redstone Ars., AL | 746-3630 |
| *Saudi Arabian Nat'l Guard (SANG) Modernization | BG J. W. Hudachek | APO NY NY 09038 | |
| SATCOM | COL F. M. Knipp | Ft. Monmouth, NJ | 992-1228 |
| Selected Ammunition | COL R. J. Cook, Jr. | Dover, NJ | 880-3230 |
| Signal Intelligence/Electronic Warfare (SIGINT/EW) | COL W. D. Clingempeel | Ft. Monmouth, NJ | 992-5344 |
| Single Channel Ground and Airborne | | | |
| Radio Subsystem (SINCGARS) | COL J. E. Wyatt | Ft. Monmouth, NJ | 995-4141 |
| Smoke/Obsecurants (SMOKE) | COL H. R. Shelton | Aberdeen PG, MD | 283-2804 |
| Special Electronic Mission Aircraft (SEMA) | COL J. J. Top | St. Louis, MO | 698-6183 |
| Stand-Off Target Acquisition/Attack System (SOTAS) | COL A. M. Cienciala | Ft. Monmouth, NJ | 996-5436 |
| STINGER | COL V. P. DeFatta | Redstone Ars., AL | 746-6191 |
| TOW/Dragon | COL A. L. Goodall | Redstone Ars., AL | 746-7194 |
| Training Devices | COL J. Leszczynski | Orlando, FL | 791-5292 |
| US Roland | BG F. P. Ragano | Redstone Ars., AL | 746-4225 |
| VIPER/Advanced Heavy Antitank Missile Sys (AHAMS) | COL J. O. Lax, Jr. | Redstone Ars., AL | 746-2131 |
| XM-1 Tank System | BG(P) D. M. Babers | Warren, MI | 273-2184 |

* Procurement Offices Also Located Here.



Electronics Command (ECOM) functional elements will be distributed between CERCOM, CORADCOM, and ERADCOM. Activation of the new commands is expected during FY 1978.

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 AVRADCOM 11
 CERCOM 7
 CORADCOM 12
 DESCOM 19
 ERADCOM 14
 MICOM 21
 MERADCOM 2
 NARADCOM 1
 TARCOM 9
 TARADCOM 3
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